TECHNOCRACY DIGEST

AUG '57

Expand or Capitulate

What Next?

Conspicuous Consumption: 1957

Pushbutton Age Ahead

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Black Is White

The Russian Robot Races Ahead

Pneumatic Tubes in Vogue

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TECHNOCRACY DIGEST

THE ONLY MAGAZINE IN CANADA THAT IS PREPARING THE PEOPLE OF THIS COUNTRY FOR SOCIAL CHANGE.

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STAFF

DONALD BRUCE.....*Editor*
MILTON WILDFONG.....*Assistant Editor*
RUPERT N. URQUHART, *Assistant Editor*
ED BRODERICK.....*Assistant Editor*
JANE URQUHART....*Circulation Manager*
HELEN SLATER.....*Business Manager*

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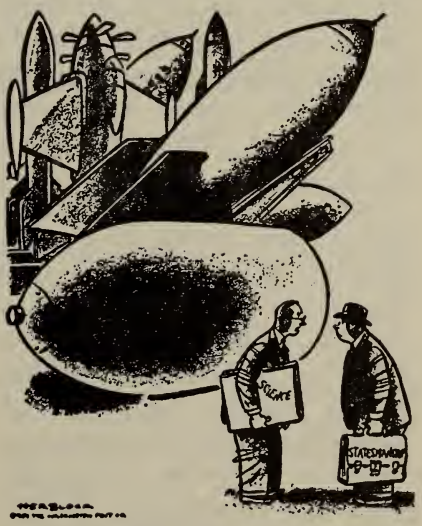
Expand or Capitulate

The Price System in its present form must continue to expand its physical base or capitulate in favor of some other system; and there isn't enough expansion in sight to keep it going. One doesn't have to be a mathematical genius to predict its eventual failure.

NO PHYSICAL thing in the world can expand indefinitely; and, if a thing is to expand at any appreciable rate, the period of its expansion must be short. That is the nature of the dilemma which now plagues the economic system of the Old Order. The Price System in its present form must continue to expand its physical base or capitulate in favor of some other economic system; and there isn't enough expansion in sight to keep it going for long. One does not require the analysis of a mathematical genius to predict its eventual failure. In this technological age, the Price System, because of its limitations, is transitory.

While it is conceivable that a Price System could exist without expansion, that would require a very special set of circumstances. Let us illustrate it by means of a fantasy:

Suppose that a social group made up of a million people living in an isolated area decided to start all over again economically by pooling all their wealth and dividing it equitably among themselves. In order to do this, suppose they turn all their property over to an administrative committee, which then sets a fixed value on all items; and, suppose further, the total value is exactly one bil-



Herblock in The Washington Post

"And What's New with You?"

lion monetary units. The Committee then mints one billion units of currency and gives 1000 units to each man, woman, and child. The people next proceed to exchange their monetary units for the goods of their choice, with the scarcer items being distributed by lot among the would-be purchasers. The Administrative Committee would serve as both banker and broker, without profit or commission. Theoretically, the people would buy up all the goods and, in doing so, would surrender all their currency; and each would have an equitable share of the physical wealth. Everyone would have essentially what he wanted; nobody would have any money; there would be no need for exchange. The system would be in balance.

But, as goods would be consumed, they would have to be replaced. In order to do this, the people would have to work to produce more goods. Now let us also assume that they produce exactly enough goods to replace those items which are consumed, otherwise expended, or lost; that the population remains constant; and that the value of specific items never changes. The Administrative Committee would buy all that was produced, paying the producers in full value for what they produced from the currency which it previously had collected from the people.

Given these conditions, it is quite probable that a Price System could be maintained without expansion. But, even then, its workability would require extreme vigilance and discipline on the part of the Administration.

It is easy to see how inequities could soon develop in the System — how some would gain more than their share and others would lose—how a few would become wealthy and the many would become poorer. Since not all the people would be engaged in production, for example the children, the sickly, the aged, and the disinclined, those that did not produce would have to become dependents or parasites upon those who did produce, for they would have no earned income of their own. Some might play upon the sympathies of the producer-workers for handouts; others would seek to swindle them in some way; others would try to sell them services and intangibles, varying from haircuts to salvation.

Since the only way to get ahead in this system would be through producing goods for sale to the administration, there would develop a struggle among the go-getters, first to work harder and longer, then to gain control of the means of production. Those with less energy or astuteness would soon find themselves working for the go-getters. The classical way of getting ahead is by enticing others to work for you, then holding out on them when it comes to dividing the proceeds. No doubt that is what would also happen in this case. Thus, the wealth — physical and monetary — would gradually accumulate in the hands of those who got ahead in the struggle to control the means of production. In a primitive type of economy, this physical wealth would consist mainly of land, livestock, and tools. In such an economy, it is improbable that the rate of production would outstrip the rate of consumption. Hence, the economy would remain in balance with respect to production and consumption.

If we can rely on history as a precedent, it will develop eventually that a few shall become very wealthy while the many will become and remain very poor. Social classes would become established. The bourgeoisie would tend to live luxuriously and wastefully, a large part of their expenditures being devoted to showing off their own importance in the society. It is also probable that they would soon take over control of the administration and the prevailing religion, thus gaining a triple stranglehold on the populace, which would be ground down to the lowest level of tolerance. This lesson we can learn from history, whether it be the history of Europe, Asia, Africa or the Americas. The operating characteristics of the Price System are the same the world over and through all ages.

In order for the people of a scarcity economy to live better as a whole, they must acquire more physical wealth. A mere increase in the amount of money on hand will not accomplish it. If the physical increase is to be obtained within the area, it means either more work by more people or an improvement in the means of production.

A temporary alternative would be the launching of a war of predation against a weaker neighbor-

ing area, during which the latter is overrun and looted of its wealth. Even if successful, such a means of increasing the wealth of the home group could not be repeated very often, at least not against the same neighboring area. Conquests for loot have been among the principal means by which historical societies have risen to positions of prominence — albeit, the real splendor and glory accrued to only a few at the top.

There are a number of ways, however, in which an economy may become expansive within its own area. For one, it may invent debt. In this instance, the people could be extended credit (allowed to go into debt) to buy now and pay out of future income. This would be socially significant only if there were a simultaneous increase in physical production, so that there would be more goods for the people to buy with their credit. Otherwise, there would be merely an increase in prices with no increase in the standard of living. This process of expansion could go on year after year, provided the amount of credit were expanded each year—enough to pay off last year's debt plus enough to provide for more new purchases this year. Should the credit expansion cease, the economy would be in trouble. For one thing, the people would be using a considerable portion of their income to pay off debts instead of making their usual purchases. A surplus of goods would pile up; production would be cut; workers would be laid off. A depression would be on. The economy could be revived only with a new expansion of debt, which would permit the people to buy more goods on credit again.

Another way in which the economy might become dynamic again would be for the administration to sponsor a major program of some kind. Usually such a program consists of a 'defence' buildup. The people are called upon to produce more than ever; and they may even be paid more wages than before, because of the longer work periods if nothing else. But there would be fewer consumer goods for them to purchase. They must either save their money or bid up the prices of the available goods. In order to hold the economy in check, as well as a means of creating more debt, the administration will try to get

the people to put their money into 'defence bonds' instead of spending it. The administration will also sell special securities of a more attractive form to the bourgeoisie in order to get them to return more of their money into the system. In addition, everyone will be taxed for an increasing percentage of his income. People will receive more money, buy more bonds, and pay higher taxes, but they will get fewer consumer goods. This process can go on year after year, provided the debt and taxes continue to increase. Unless there is a shooting war, such a pattern is hard to maintain —hard to 'sell' to the people as a steady program.

An alternative to a defence program would be an internal construction program, but this has never been popular among the bourgeoisie. Remember how they squealed like stuck pigs over the minor construction programs of the Roosevelt New Deal? The United States appears to lead the world in its opposition to any form of government-sponsored internal construction program.

Another technique of expansion which is nearly as good as a defence program is foreign trade. If the society can sell its goods abroad, the economy will bring in more money, but the amount of physical goods to be consumed by the people will be reduced by an equal quantity. This trend may be compensated for, however, if the money received from foreign sales is used to import foreign goods of equivalent amount. In fact, a distinct advantage occurs if our goods can be sold dear and our imports from abroad are acquired cheaply. If that enviable state of affairs can be maintained, the economic system will be in its glory. The empires of Europe rose to the zenith of their glory through this type of parasitic exchange.

If, on the other hand, the process of favorable exchange becomes reversed (or if it is viewed from the other side), with the home country selling cheap and buying dear, the people of the area will be in for a period of austerity. In other words, if a Britain is to be Great, then various other areas of the globe must experience toil and poverty. The situation becomes hopeless if the production at home is insufficient to supply the country's needs, and more must be imported than

is exported. Now, as the colonial areas of the earth diminish in extent, and as all countries become more industrialized internally, the advantages of foreign trade diminish correspondingly.

The economy may expand if the population increases in size, provided the physical production can be expanded at the same time. If the physical production remains the same, while the population increases, the economy not only does not expand but the standard of living shrinks and the probability of 'hard times' increases. For example, Britain and Italy today are not able to expand their physical production in proportion to their respective increases in population; as a result, there is a strong desire among the people to migrate to what they think are more favorable areas, meaning Anglo-Saxon America, New Zealand, and Australia.

Expansion may also occur if more territory is acquired by the social entity. While the mere addition of more territory most probably will result in a greater total volume of economic activity, the effect on the citizens, pro rata, depends on the economic status of the newly acquired area. If the new area is rich in resources and low in population, the net gain may be advantageous; if the two areas are about equal in these respects, there will be no net gain; if the new area is heavy in population and light in resources, there will be a net loss. Most parts of West Europe and southeast Asia are in this last category—deficit areas—hence, a 'pain in the neck' to their sponsors.

The greatest expansion of an economy occurs when the technological capacity for production is increased and operated to full load. Such expansion depends primarily on the acquisition of basic technology and secondarily upon available resources, both energy and mineral. Other than that, it depends upon the availability of trained technicians. Technological production may increase the output of goods so greatly that there is potential abundance for all in a given area. But, how to get this abundance into the hands of the consumers is an insurmountable problem under the Price System.

So long as the technological means of production are privately owned and operated on a profit basis, much more is going to be produced than the money of the

area will purchase. The wage-workers can buy, out of their earnings, only a small part of what they are instrumental in producing. Unless drastic measures are taken, surpluses pile up; the distribution flowlines become filled; production is curtailed; workers are laid off; and a depression is on. The classical way of reviving the economy from a depression, as we have already noted, is through large injections of new credit (debt) into the system. But, under conditions of high productivity, that kind of revival becomes very expensive. The last big depression on this Continent needed the debt creation of World War II to counteract its retractions. The Korean War revived the recession of early 1950.

Louisville Times

Peeking Through the Barrier

Under conditions of abundance, it would be useless to approach the problem with printing press money. There would still be the job of getting additional purchasing power into the hands of the consumers. If some device were attempted for distributing more money, such as raising wages, this would be promptly overcompensated by an increase in the price of goods. The system would still be stymied.

If, on the other hand, prices were allowed to find their 'natural level' on a free market, they would drop so low that it would be uneconomical to produce; and a downward spiral would set in, as in the early part of the Hoover depression.

When there is a relative or virtual abundance of goods, the most effective method of getting them into the hands of the consumers under the Price System is through the amplification of credit. With the employment of this device, the people do not have to earn or otherwise acquire

money (as such) in order to make purchases. All they have to do is promise to pay for the goods at some future time. This is fine for the Price System, provided the annual expansion of credit is sufficient to cover last year's indebtedness and supplement this year's wages. If this expansion cannot be maintained, the economy must retract and eventually capitulate.

The situation becomes seriously aggravated if the production of various goods exceeds the consuming demands of the population. The United States and Canada lead the world in productive capability at present. They also produce much more of many items than their citizens can purchase or even consume. They have expanded credit amplification to proportions which are alarming to the conventional economists. The citizens do not earn enough income to buy more than a part of what they want of that which is available, but this is supplemented in large measure with easy credit. Even so, the economic system cannot move all that is produced, consequently it is threatened with burdensome surpluses. To curtail operations would mean a depression worse than any previous depression, and the bourgeoisie do not care to be socially responsible for such an event. But, since the bourgeoisie virtually own the governments, they can prevail upon said governments to institute certain relief measures for them, and for the economy in general.

One of these relief measures is a huge armaments program. Under such a program, corporate industry is able to continue production and pay out wages. The government buys the output at a satisfactory markup, and government credit and taxation pays the bill. The product does not have to be purchased and used by the consumers, hence there is not the problem of moving it on the market.

An armaments program has only limited usefulness, however. It may be restricted by available resources, by capacity to create debt, and by problems of deployment, especially in peace time. Then, the high rate of taxation required to help support it tends to defeat the economic system; for, it takes purchasing power out of the pockets of the consumers. It also tends to create a problem in social tolerance.

If a war can be arranged and kept under control, the ability to expand credit (debt) is facilitated; deployment of material can be handled by bulldozer techniques; and popular fervor permits a greater squeeze being inflicted on the public. But such wars are no longer easy to arrange. Even the nice little war in Korea threatened to get out of hand, and the American public could see no sense in it; so, with the greatest of reluctance on the part of our leaders, it was abandoned.

Without a huge armaments program or a war (or a huge construction program), an economy of potential abundance under the Price System would bog down rapidly. It has already reached the stage in North America where the United States and Canada must continue a feverish preparation for 'imminent' war on an expanding basis or their Price System must capitulate. The war budget of the United States gets larger, year by year.

A lesser alternative to a war program is a dumping program. That is, the government expands its credit and raises its taxes in order to buy up the surplus production of the area and dispose of it — through outright destruction, storage, or dumping abroad. For some sinister reason, the bourgeoisie are dead set against the surplus being given to our own citizens, even after they have paid for it twice. Instead, the citizens must be charged again for the costs of dumping it. Anyway, it gets rid of the abundance, and that is the main objective. The trouble with such a dumping program is that it suffers the same limitations as an armaments program, only it is not so large or effective. Furthermore, the limits of social tolerance are reached more quickly. A war preparation program is much to be preferred, and a 'limited' war is even better. There is a difference in social acceptance between sending a shipload of stuff out where it can be sunk by an enemy submarine and taking the shipload out on the ocean and sinking it ourselves.

For more than a decade, the governments of the United States and Canada have been doing all they could to promote inflation— as a means of 'easing' the debt burden — although, at the same time, the lie of 'fighting inflation' has been preached by the leaders

as a routine sermon. Under conditions of approaching abundance, inflation is very difficult to accomplish, although the device of spiraling wage hikes and even greater price rises has had some modest effect. However, inflation would accomplish nothing on this Continent other than repudiate some debts and liquidate some savings. It would not move more goods, which is the crucial problem.

All the known gimmicks of the Price System have been, and are being, worked by our North American government, to no lasting advantage. True, the excessive credit expansion of World War II and the postwar boom have provided a semblance of prosperity. But it is the prosperity of a poor man who has suddenly been able to borrow $5000 in cash and then goes on a spending spree. Price System prosperity is nothing more than a pipe dream in an opium den of easy credits. But it has seemed real enough to the majority, inflating their egos to pompous proportions, dulling their economic wisdom, and causing them to acquire bourgeois aspirations.

During this stage, it has been difficult to talk to people. Of what could one talk? When people are convinced that their dream is the real thing, and they are all having the same dream, you can't talk to them except in terms of their dreamworld.

But dreams have a way of coming to an end, be they good or bad. Now, a terrible new dawn is approaching — terrible in terms of present social values and aspirations—but glorious in its potentialities. A whole new era in social living is near at hand — not a utopian dream, but a scientifically determined probability.

Technocracy early analyzed the operating characteristics of the Price System and arrived at certain conclusions regarding the viability of that system on the North American Continent. Among other things, it was determined that the Price System economy would have to expand at a rate of more than three per cent each year if it were to continue to operate. That is the minimum rate under which last year's discrepancies can be covered up by this year's expansion. It required no difficult thinking to conclude that this rate of expansion was limited in time and extent; that,

at some time not very far distant, the limits of tolerance would be reached, and the Price System would be unable to resolve its problems. When the Price System becomes stalemated, it will have to capitulate, and a new social order will have to be installed if chaos is to be averted.

There are those who argue that the 'powers that be' will not permit social change. We are not impressed by that argument. Not even the most ardent horse lover will keep his horse on the premises after it is dead. No sea captain wants to be at the helm of a ship that is stranded on the sand. We can be sure, the leaders of the Price System will desert like rats when they see its flowlines stalled.

While the general outcome of the Price System trend could be foreseen and the probabilities under given conditions calculated, it was not possible for Technocracy to anticipate in detail the exact nature of all coming events. Hence, it has not been possible to chart precisely the course of the Price System either with respect to time or rate of obsolescence. But there has never been any doubt among Technocrats that the Price System is on its way out, no matter what the detailed course of events or the timing may be. A system capable of distributing abundance must supplant it.

North America's growing technology has enabled a potential rate of expansion much greater than the necessary three per cent; and, if it had not been interfered with, it would have compelled social change of a fundamental sort before now. But, because of Price System restrictions, the full capabilities of this capacity could not be realized. Many of the interfering restrictions were relieved, however, with the great amplification of credit which the war and postwar situation permitted, and the expansion boomed well above the required minimum of three per cent.

Now there are growing signs that this rapid rate of expansion has about run its course. The savants of the Price System are worried once more. There is grave danger that the administrators of this Continent, out of fear and frustration, will attempt desperate measures to prolong the existence of their ailing Price System. Not the least of these dangers is World War III.

The great majority of North America's citizenry have tended to judge the course of events by their superficial aspect. The rapid postwar expansion of our physical plant created a surface bloom of prosperity. The Price System publicity men became enthusiastic about America's future, predicting ever greater prosperity and consumer abundance as well as ever greater elegance—all extending into the future for many glorious years.

The public, ever shallow in its appraisals of social phenomena, accepted the ballyhoo in total. The individuals proceeded to adjust their lives to the new 'perpetually expanding prosperity' and to abandon any doubts they may have had concerning the everlasting verities of the Price System. This revival of faith became reflected in symbols of 300 horsepower convertibles, ranch houses in the suburbs, larger and more cultured families, and expensive yearly vacation trips. At the same time, there developed a phobia against any social concept that would question the validity or permanence of their newly acquired setup. In such a social atmosphere, the fascistic repressions of McCarthyism spread like a plague.

Throughout the surface storms of the past two decades, Technocracy did not waiver in its position with respect to the Price System. Nor did Technocracy become diverted into the sideshow controversies of the moment. It continued to appraise events in the light of its objective analysis and long term projection. The social administration and the public in general wanted to forget the social program which only a couple of decades earlier had been hailed as the greatest social idea of all time. But nasty little flaws kept showing up in the fabric of the status quo, bringing back flashes of memory from the dirty thirties and reminders of Technocracy. Now, those flaws are becoming larger and more conspicuous than ever.

The economic future of North America is the balanced load operation of an economy of abundance. The Price System, by its very nature, is incapable of handling such a problem. An entirely different economic mechanism from any used in handling a scarcity is required. While there may be numerous ways of distributing

a scarcity, the choice of means for distributing abundance becomes narrowed down to one — Technocracy. No other means has ever been devised or even conceived.

The specifications for an economy of abundance are essentially these:

It must produce all that the people of the area can consume, limited (if at all) only by the availability of critical resources.

It must distribute goods and services to the entire population equitably, limited only by the capacity of the individuals to consume.

It must abrogate all class distinctions based on wealth or property. In abundance, there can be no economic differentials among the people.

It must operate at balanced load to avoid waste and unnecessary over-capacity. This requires a continuous statistical inventory and accounting system.

In connection with balanced load, it must smooth out the oscillations in the social system, with particular reference to the intolerable peak loads that now accompany the daily, weekly and yearly schedules of our society.

It must avoid major social disturbances, such as war, factional strife, and ravages by 'the elements.'

The Price System fails to meet these specifications on all counts. It must have scarcity, price and profits. It feeds on calamity. The pretense of maintaining scarcity values in the presence of abundance is becoming more farcical, year by year.

As for expansion, what is left for the system to expand to? There are already too many factories, too many stores, too many service stations, too many cars, too many homes in suburbia and too many consumer gadgets. Most productive equipment has to restrict operations to one shift per day and five days or less per week, even that which is employed in 'defence' production. The writing is on the wall for all who are literate in economic matters to read—'going, going, gone!'

When the enemy is too powerful to be defeated, it is considered to be an act of wisdom to join forces with the enemy and become one with them. The enemy of the Price System is Abundance. Of course, the Price System and Abundance can never get to-

gether; but it would be a simple matter, and an act of utmost wisdom, for the people of North America to repudiate the Price System and join in the march to Abundance. Be the kind of sport you have always been — abandon the loser and join the camp of the winner. Only Technocracy can meet the specifications of the New Order that Abundance is forcing upon us. Technocracy will be the only winner in the showdown battle between Abundance and Scarcity.

—Wilton Ivie, CHQ

★ DETROIT—'The task of building a society is predicated upon the availability of three basic commodities — materials, manpower and money,' Louis C. Goad, General Motors executive vice-president, told a group of engineering and science educators here recently.

'I'd like to add a fourth — energy,' he added. 'Not only is this true today, it was true thousands of years ago. But I think it is astounding that we have made more progress in technology . . . more in the past century than was done since 6000 years before the birth of Christ.'

Mr. Goad addressed the Sixth GM Conference for Engineering and Science Educators at General Motors Technical Centre.

'The key to this amazing progress, of course, was the development of new sources of energy,' Mr. Goad said.

'We now have new sources of energy requiring a higher order of technical ability, if they are to be used effectively,' the GM executive declared.

—Associated Press

★ SAULT STE. MARIE, Ont.—The world's first completely mechanized seamless steel tube mill has been opened here.

Operated by Mannesmann Tube Co., the mill has been hailed by industrial experts as Canada's introduction to the age of industrial automation.

The $20,000,000 plant, spread over a half-mile area, is operated by a staff of 30 men in a push-button operation geared to produce 225,000 tons of tubes annually.

—British United Press

★ NEWBURGH, N.Y.—Ore from Cobalt, Ont., mines will be the first to be processed commercially at a new 'smelterless' plant to be opened here by Metallurgical Resources Inc.

The plant is the first to use the Sill process, a recently-developed method for processing economically ores with high arsenic and sulphur content.

The process, using low temperature and air pressure, makes possible the removal of arsenic and sulphur in commercial forms, simplifying the separate removal of cobalt, silver, nickel, copper, iron and other minerals in the ore concentrate.

—Canadian Press

★ GROTON, Conn.—The nuclear submarine Nautilus travelled 60,000 miles on a lump of uranium 'smaller than a light bulb.'

The submarine is being refuelled for the first time since she started out on her first journey January 17, 1955. *—Associated Press*

What Next?

In spite of themselves the citizens of this Continent must soon surrender to the forces of abundance and institute that functional program of social operation which is 'in complete intellectual and technical accord with the age in which we live.'

FOR OVER a generation North Americans have been conducting a full-scale undeclared war against themselves. An eminently successful application of science and engineering to the physical problem of production has put unprecedented abundance with all of its benefits within the grasp of all citizens. They have chosen instead to retain their obsolete Price System—a type of social control which was conceived under conditions of natural scarcity and is dedicated to the perpetuation of those conditions. Planned waste, inefficient operations, deficit financing and global give-away programs have been some of the futile weapons used to stem the inexorable tide of consumer goods flowing from an embarrassingly provident technology. It has been a losing war for the Price System, so it appears that in spite of themselves the citizens of this Continent must soon surrender to the forces of abundance and institute that functional program of social operation which is 'in complete intellectual and technical accord with the age in which we live.'

Technocracy's social blueprint, specifically designed for conditions of abundance, will render possible for all citizens of North America a standard of living equivalent to that enjoyed today by persons in the $30,000 per year income bracket. Judicious use and minimum wastage of resources will combine with effective employment of personnel and all other factors considered in the latter portions of the two previous articles* of this series to provide a standard of living higher than any of the philosophers of yesteryear ever imagined.

What is a high standard of living?

Briefly, it is one which gives all residents of a richly endowed

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* *'Waste Not, Want Not'—Feb. Issue; Whence the Manpower'—May Issue.*

land area ready, unrestricted access to all services and products of their advanced technology — this plus extensive time and opportunity to devote to avocational pursuits. If, for any reason, a large proportion of residents are substantially denied these attributes, the consequent lower living standard suggests a basic fault in social organization. Thus, most North Americans — especially Canadian and United States citizens—are living at a standard far below what their science and technology could provide, simply by refusing to relinquish their scarcity-born Price System controls.

Food, clothing and shelter are basic essentials which a responsible society should take upon itself to supply adequately to all citizens. Important as they are, they sometimes assume an abnormal perspective with people who find them hard to get, especially when their society foists off upon them the responsibility for acquiring those essentials. Under such conditions, private property tends to be considered as all-important to the assured future supply of the vital commodities; which in turn gives rise to the philosophic dictum against the worship of material gain. Both of these concepts are products of scarcity conditions with no validity in an opposite environment where all material requirements are provided as a regular and normal function. Relieved of the constant worry of acquiring them, the citizenry could concentrate more attention on extracurricular activities.

An optimum living standard infers the fully assumed responsibility of society to provide all material needs of the populace such as those just mentioned as well as education, public health services, transportation and communication facilities, etc. Moreover, they would be provided around the clock and around the calendar. Have you ever been awakened in the night by an agonizing toothache and been unable to receive prompt dental attention? Or have you found yourself wanting to buy some item of apparel on a weekend or other time when all such stores are closed? If so, you will appreciate the desirability for continuous service such as is rendered by metropolitan telephone companies. Are other services less essential or immediate than communications?

High on the priority list of necessary services provided by a functional society would be adequate housing for all citizens. Living units would incorporate every feature developed by housing technologists to emancipate housewives and to add to bodily comfort. Most people would reside in tall multiple-dwelling buildings incorporating the best features of today's finest hotels and apartment blocks. Soundproofing and weather conditioning would combine complete privacy with all-season individual room temperature control to attain an excellence of accommodation hardly achieved today even in the most ostentatious homes.

The multiple-dwelling units will give housewives an opportunity to live such as they have never had before. To be sure, some may wish to continue doing their own housework — baking, cooking, laundering and so on — but given the chance to use the numerous facilities for easy living which would be available in the structures mentioned it is a safe bet that most women would quickly take it. How many of them, for instance, would insist on doing the family wash themselves when they had the following readily accessible service at their disposal?

All suites would have laundry chutes for conveying washing or other soiled clothes to a central laundry room where they would be electronically identified before being washed or drycleaned according to respective requirements. This would make it both unnecessary and undesirable to accumulate volumes of washing for later attention as is ordinarily done today. Instead, all that need be done is to drop garments directly into the chute, then forget about them. An hour or so would see them back ready for wearing again.

Other advantages of the functionally designed residential buildings of tomorrow have partial counterparts in today's better hotels. These include the daily maintenance attention given to all rooms such as vacuuming, bedmaking, window washing and other tasks as may be required to keep the premises in tiptop condition. None of the responsibility therefore falls on the shoulders of the paying guest who in addition has ready access to room service for receiving prepared full-course

meals or lighter refreshments plus shoe shining service, barbering and a variety of others. Of course, the extension of these today all have a monetary motivation, but it is their functional attributes with which we are now primarily concerned. Actually, however, there is no present counterpart which adequately depicts the advanced living conditions which would result from the construction and operation of multiple-dwelling units especially designed to provide optimum living standards for all residents. Some of these are indicated in the following quotation from 'A Place to Live In,' an article appearing in an earlier issue* of this magazine:

'With vertical expansion, say in a sixteen-storey, reinforced concrete structure, the bottom one or two floors can be used to provide public facilities, such as dispensaries of s u p p l i e s anl personal services, lounging and recreation rooms, nurseries, offices, etc. The basement can be u s e d for the building service equipment, laundries, workshops, storage, and car garages. The top floor can be used for restaurants, reading rooms, ballrooms, and other public facilities. The intermediate stories can be devoted to dwellings. Rapid, completely automatic e l e v a t o r service provides easy and comfortable vertical transportation... Further, with the population all housed and s e r v i c e d within a small space horizontally, parks and other open recreational areas can be situated close at hand and maintained for public use.'

For a more comprehensive picture of t h e tremendously improved housing standards automatically accruing from a society fully adapted to its physical environment, the reader is recommended to r e a d the complete article from which the above extract was quoted. The many features discussed therein are physical prerequisites to a high standard of living, the broader implications of which will be considered shortly. While the foregoing has been merely a general description of the potentialities of science applied to an environment of abundance, it follows that any design drawn to adequate specifications will closely approximate the results. Accordingly, the social blueprint of Technocracy, being the only program coinciding with

* *November,* 1955, *Issue.*

(*Continued on Page* 33)

OBSERVATION - STUDY - ANALYSIS - REPORT.

RESEARCH BULLETIN

AUGUST, 1957 *Compiled by Editorial Staff* No. 109

The Russian Robot Races Ahead

TWO BRITISH MACHINE-TOOL EXPERTS have just come back from the Soviet Union with this warning:

The Russian robot is streets ahead of Britain in the automation race.

'We are trying to win a gold medal by walking in a race with a four-minute miler,' said Mr. Peter Tripped, associate editor of **Metal-working Production**, who toured Russian factories from the Baltic to the Black Sea.

'Unless we learn their lesson the Russians will leave us standing,' he added.

Within a few years, the Russian robot may cause unemployment here. It may reach out for our overseas markets with cheap machines, quickly produced.

How quickly?

A Moscow robot factory, looked after by 178 men in two shifts, turns out 1,500,000 bearings a year. It is fully automatic.

Rough material goes in at one end of the line. It comes out at the

other as finished products—wrapped and labelled—without being handled once.

Even inspection is done by a robot machine, which measures and rejects the 'duds.'

It is the most advanced production unit of its kind in the world, including America.

The Russians regard it as out of date already.

In Britain, it is still in the future, said an official of the Department of Scientific and Industrial Research.

One Russian factory working **one** shift can produce almost as many machines of a particular type on **one** production line as the whole of Britain.

For example, a single conveyor line in Moscow makes 12,000 small universal lathes a year. Another at Ryazan, 2000 medium screw-cutting lathes.

Britain's total yearly production of such lathes is 14,047, according to the latest available figures (1951).

'These Russian factories are **not** showplaces,' said Mr. Trippe. 'They are practical working units.'

How do the Russians do it?

They use enormous shock brigades of designers and research workers in central establishments.

They employ between 2500 and 3000 planners and trouble shooters. As soon as a Ministry decides to modernize a factory, they swoop on the problem, plan, advise and concentrate on that factory for a short time.

Then they switch to another factory. And each factory has a large design staff of its own to carry out ideas.

In Britain, manufacturers cannot afford such huge staffs of designers. The Machine Tool Trades Association has no research unit of its own.

British firms consult the Production Engineering Research Association at Melton Mowbray. Staff, 180. Total yearly income, about £150,000.

There is a similar unit at Glasgow, run by the Department of

Scientific and Industrial Research. But D.S.I.R. gets only six to seven millions a year for **all** kinds of research (compared with £200,000,000 the Government spends every year on research for defence).

How long does it take the Russians to design an automatic or semi-automatic production line containing as many as 600 robot machines, build them, set them up and get them going?

Only eighteen months—from drawing-board to production.

By our standards, this is fantastic.

By our methods, it is impossible, say production and planning engineers.

It can take anything up to three years to get delivery of a British robot machine.

And Russian factories are not handicapped by being offered machines and units of different sizes.

They have standardization, which British manufacturers still tend to fight—fearing that a customer may buy the same-size machine from a rival.

But there is more behind Russian success in production than the power of a monolithic State.

'They have a brand-new approach,' Mr. Trippe told me. 'It is an attitude in which complacency doesn't exist. When a new production line is installed, they no longer regard it as new.

'That is why I was allowed to go everywhere, taking photographs and copying plans. They have nothing to fear from competition, they say, because everything I saw was already historical.'

What of the workers? Together with Ministry officials, planners, designers and directors they are part of a remarkable driving force.

They have zest, enthusiasm, team spirit.

'Anyone who thinks they work frantically under the stress of fear is mistaken," said Trippe. 'But there's a sense of urgency, almost of mission.

'Every man is behind it. The same spirit is not found in Britain.'

One Russian director told Mr. Trippe: 'We can make machines cheaply. Our particular p r o d u c t costs about £1000. A similar American machine costs £2500.'

Britain's robot has made some strides. We have remarkable automatic systems turning out car parts, robot oil-refining, some automation in the chemical industry, a small automatic factory making building-board.

But leading machine-tool manufacturers say: 'We have long-term plans which cannot be put into effect while there is a continued shortage of skilled technologists—and of labor with that high degree of skill needed by an industry so exacting in its requirements as ours.'

And manufacturers and workers alike are handicapped by lack of a national blueprint for automation, which the Daily Mirror urged eighteen months ago.

There is still no central control, no Government plan, no national policy to help the great changeover to automation, no preparation for the problem of labor displaced by machines.

Mr. Norman Stubbs, editor of **Metalworking Production,** has the last word: 'We must re-think our whole attitude to production.'

Unless we do, Russia may become the Workshop of the World and Britain the Workhouse.

—Frederick Wills in London Daily Mirror

Pneumatic Tubes In Vogue

NEW-FOUND sophistication has made the pneumatic tube — the familiar sales slip carrier of the old-fashioned department store —almost unrecognizable. What's more, the new look is helping to bring the tubes back into vogue.

The latest systems combine the wizardry of the telephone circuit and the railroad dispatcher's art. Plastics-walled carriers are now dialed to their destination, automatically switched at a central control station to the right outgoing line, and then automatically popped out at the right station. Built-in controls prevent traffic jams within the tubes, signal maintenance personnel in the event of trouble, and even pinpoint the spot.

First Installation—So far, the only dial-controlled system in actual operation is in the White Plains (N. Y.) headquarters of the Standard-Vacuum Oil Co. Others, however, are in process. The Guaranty Trust Co. of New York is installing a 6-line, 31-station system as part of renovating its main office and the National Bank of Detroit recently ordered a similar system.

Standard-Vacuum's system—3 lines, 20 stations—costs approximately $190,000. It was designed and built by the International Standard Trading Corp., a fully owned subsidiary of the International Telephone and Telegraph Corp. Since that time, IT&T has formed a separate subsidiary, Airmatic Systems Corp., to handle and promote its pneumatic tube systems.

Big Advantage—Automatically switching the pneumatic tube carriers around as if they were telephone calls has one big advantage. Each branch, or line, only needs one sending and one receiving tube, even though it may serve up to 10 stations. New stations can be added on by just tieing in to the end of an existing branch—up to that line's limit.

Old-style, manually operated pneumatic tube systems required one sending tube and one receiving tube for each station — plus an operator at the central control station to shuttle the carriers from one tube to the other. The complications involved in installing such a vast network of tubes, and the need to run a pair of lines all the way back to the central station everytime you wanted to add a station, for years limited the use of pneumatic tubes to comparatively simple installations.

Life Saver—'Automating' the pneumatic tube has probably saved it from extinction—at least in office installations. The 'telephone dial' system—with the controls built into the wall of the sending station—is the ultimate. But there are other less refined systems in operation. In these, the dial control mechanism is incorporated right into the carriers. A twist of the wrist sets the station—and at the same time sets in an electrical configuration of contacts. When this type of carrier hits the central switching position, it is momentarily grabbed

and read by a sensing device—relays are activated—and the carrier is off to its destination.

Moving the 'dial' off the carrier and onto the wall has several hidden advantages. It makes it possible to install sender locks. These automatically keep the carrier from being sent off until there is room in the line for it. And, of course, it reduces the cost of the carriers. This is an important saving because the carriers are really the only part of the system that ever wears out.

Simple Traffic—The old-style carriers—of the department store variety—are still in demand for a variety of uses that do not lend themselves to automatic systems. Traffic in these systems is usually comparatively simple, often is one-way.

Newspaper offices use such systems to get their copy out to the composing room. Large libraries use carriers 6 by 12 inches on end to transport books from the stacks to the front desk.

It was not until automatic systems were imported from Germany in 1950 that the pneumatic tube systems started to realize their possibilities. The brand-new telephone automatic systems are just a refinement of these older automatic systems.

The first installation in the U.S. of the old-style automatic system was in 1951 at the Bridgeport Brass Co., Bridgeport, Conn. The company uses its system to speed metallurgical samples from two separate plant locations to physical and chemical testing laboratories in the main building, and for routing some of the daily load of paper work from place to place within the plant. Since that time, at least a dozen or more of these dial-carrier systems have been installed throughout the country, many of them in hospitals.

Complex Applications—The fully automatic systems are only useful when you have large interdepartmental traffic, according to W. R. Stieber, the general manager of Airmatic Systems Corp. Standard-Vacuum, for example, can use such a system to take full advantage of its central filing and remote dictation-transcription systems. Its large volume of overseas cables (5,000 per month) also are assured prompt delivery. All in all, the system handles about 2,800 carriers a day, but it can handle up to 1,500 an hour.

The carrier for Standard-Vacuum's pneumatic tube system are oval-shaped, 4 inches by 7 inches on end, and 14 inches long, which makes it possible to transport file folders throughout the system without bending them. The carriers can also be used to transport office supplies up to 7 pounds in weight.

Fully automatic pneumatic conveyors — utilizing air pressure and/or vacuum—are the most sophisticated of the air conveyor line—but they are also extensively used in industry as bulk conveyors. Foundry sand, electric bulb cases, cans, nuts and bolts, are among the materials conveyed in bulk. **—Business Week**

Automation Changes Railroads

NEW YORK — Peter Smith is an ordinary guy who, on any given day, has considerable power. Pete presses buttons.

When Pete presses a button, he slices up a freight train as if it were a chunk of bologna, divvying up the pieces—you call them cars—along any number of 63 different railroad tracks.

Peter works at the control panel in the hump tower of the New York Central's new freight classification yard at Buffalo.

Freight cars to be classified are pushed to the crest of the hump by locomatives whose crews are directed by radio and color-light signals.

As the cars pass the hump, Pete pushes his buttons. That sets switches all along the line, sending one car down one route of tracks, a second another route, a third still another route.

Pete is the centre of a railroad revolution.

The railroads are rushing into automation and mechanization.

They are experimenting and adopting new, novel techniques. It is a gigantic effort to maintain or expand earnings, to keep from sinking into the red, to meet competition from other types of transportation.

Out of it have come some interesting developments:

The Santa Fe has installed several hundred miles of continuous welded rail. Each rail is one quarter mile long. It is transported to the site on railroad flat cars. When the trains goes around a bend, the rail just bends with the train.

The Chesapeake and Ohio is testing an electronic detector to spot overheated journal boxes on railroad cars. Detector units, equipped with infra-red lenses, parallel the tracks. When a hotbox goes by, the detector flashes a warning and the train is stopped.

The Northern Pacific is installing a 2,000-mile transcontinental dial telephone system, the longest system of its type in the country.

The New Haven later this year will install a new electronic ticket reservation system. The ticket agent, by punching keys on a machine resembling a cash register, may determine in moments just what space is available on any train for a month ahead.

—Associated Press

Pushbutton Age Ahead

THE PUSHBUTTON ERA IS JUST BEGINNING. Here's what's in store :

Automobiles will be electronically guided safely to their destination.

Husbands will communicate with their wives through two-way radios—like Dick Tracy's wrist watch—which will operate for a lifetime on the bearer's body heat.

Aircraft will be guided completely by electronic computors stationed on the ground.

All radios will work without power cords.

Tiny television sets will project large images on the living room wall.

Steaks frozen in electronic deepfreezes will cook in two or three minutes on electronic stoves.

Impossible? Not according to Canadian Aviation Electronics Ltd. president K. R. Patrick, an enthusiastic prophet of the age of automation.

Mr. Patrick, in Vancouver to address the Men's Canadian Club, believes 'automation may have the same beneficial effects on our community within the next 25 years as the industrial revolution during the last 250.'

It will make possible, perhaps within 20 years, a work week of 30 hours, vastly improved products, and an opportunity for mankind to accomplish great intellectual advances.

Mr. Patrick envisages a network of whirring computors directing the air traffic of an entire continent. Planes will be guided every moment of their flight, they will be shifted from their course when the machines find more favorable wind and weather conditions. The computors will prevent accidents.

A motorist will select suitable pushbuttons before he leaves his garage, and his version of the aircraft auto-pilot, combined with electronic highway controls, will enable him to ride all the way in the back seat.

Mr. Patrick said electronic anti-collision devices are already under active development.

Housewives will have electronic washing machines. The water or solvent in which the clothes are placed will appear to be motionless, but high frequency shock waves will scrub the clothes with loving care.

Doing the laundry will be the work of five or six minutes.

Within a very few years, said Mr. Patrick, developments in Trans-Atlantic communication will permit viewers here to watch a show being performed on a U.K. or European stage.

And there's more to come.

Telephones combined with television will enable phone subscribers to see each other face to face.

The post office will become completely electronic. Letters, pictures, drawings will probably be sent to their destination in a fraction of a second, ready for instant delivery.

—Tom Gould in Vancouver Sun

Through the Technoscope . . .

Technocracy examines the various social and technological trends in North America today which point to the necessity for a new social mechanism that will provide security and abundance, with a minimum of working hours, to every citizen on this Continent.

AN AUTOMATIC VOLUME CONtrol for regulating radio and TV sets when a telephone is in use is being manufactured by Carloma Corp., St. Louis. Lifting the phone receiver automatically lowers volume to a whisper and putting it back on the hook returns sounds to normal. The device is called a Sound Husher.

A FILTER FOR OIL PUMPING equipment that allows fluid to pass. through its pores but rejects sand has been developed by Clayton Mark & Co., Evanston, Ill. The synthetic foam rubber filter element reportedly increases an oil pump's efficiency 500 per cent.

THE ENTIRE OPERATION OF A new coal preparation plant handling 450 tons per hour at Moss No. 2 mine of the Clinchfield Coal Co., at Clinchfield, Virginia, is handled by two men. The main control panel operates wet cleaning and screening equipment, and the second station controls drying operations. The plant was designed and built by Link-Belt Co.

AN EMERGENCY JET FUEL THAT ignites spontaneously on contact with air has been developed by the Wright aeronautical division of Curtiss-Wright to combat the danger of flame-out. The pyrophoric fuel is said to work better at high altitudes than present electrical systems for re-igniting jets that have gone out. It is a mixture of aluminum trimethyl and aluminum triethyl; less than one cubic inch is needed to re-start a jet.

AN ANTI-FOG FLUID THAT IS SAID to keep lenses and other glass and plastic surfaces clear for long periods has been developed by American Optical Co., Southbridge, Mass. The fluid, called Super-Clean, can be sprayed on and then wiped off with cloth or goggle tissue; the maker says it is non-toxic, non-flammable, and does not damage metal or rubber.

A DOUBLE-BARRELED COMPUTing system that thinks ahead of guided missiles will be built for the U.S. Air Force by General Electric. The duty of this 'real time' closed-loop analysis system is to compare a missile's early flight behavior against the predictions and then transmit the needed corrections while the missile is still in the air.

A HYDRAULIC ELEVATOR THAT hooks onto a fork lift and uses the lift's pressure makes it easier to service equipment that is overhead, below floor level, or recessed. Called the Hi-Ranger, it has a jointed arm with a capacity of 300

pounds; the arm will reach out 40 feet in any direction—up, down, or at an angle. One man can operate the Hi-Ranger which is made by Mobile Aerial Towers Inc., Fort Wayne, Ind.

A SMALL PORTABLE HYDRAULIC dredge manufactured by Service Machinery Corp., Miami, Florida, will dig up to 150 cubic yards of material per hour and convey it up to 2600 feet from the point of excavation. It is powered by high pressure hydraulic motors and operated by one man.

A NEW SYNTHETIC FIBRE FELT is being groomed by American Felt. Co. for the reinforced plastics business. Recommended as an overlay material for use with laminate glass mat structure such as boats, auto bodies, tank linings, the mechanically interlocked felt gives a stronger and better appearing surface, simplifies fabrication. Dynel, the acrylic fibre used, is made by Union Carbide Corporation.

A SILVER ALLOY THAT RETAINS high electrical and thermal conductivity has been developed by the Venture Corp., Newark, N.J. The company says that its product, Ventureloy II, can take greater current loads, higher frequencies of operation, and greater contact forces than silver-cadmium oxide and other frequency contacts. And it can be cast, rolled, drawn, or formed by any commonly used metal-working method.

AVISCO XL, A HIGH-STRENGTH staple fiber, is the biggest improvement in Rayon since its invention, claims American Viscose Corp. of Philadelphia. Rayon yarns of the new fiber are 40% stronger when dry, 70% stronger when wet than conventional rayon. Expected applications: in industrial ducks and tarps, blends with acrylics and polyesters, lighter-weight fabrics.

A STARTING DEVICE FOR OUTboard motors, chain saws, generators, and other equipment using combustion engines has been developed by Simmons Starter Corp., Albany, N.Y. The device is held in the chuck of an electric drill and the starter end is applied to the nut of the motor flywheel shaft.

A NEW WAY TO DESULPHURIZE iron has been developed by Battelle Institute scientists in a research program for Diamond Alkali Co. of Cleveland. Under laboratory conditions, the process has achieved 90 per cent reductions in in sulphur content of pig iron before its conversion into steel.

RADIOACTIVE GOLD HAS BEEN used to make fuel burn faster in aircraft and rocket engines at the University of Michigan. Propane gas was directed through a nest of radioactive gold wire, then ignited. Result: It burned 50 per cent faster than ordinary propane gas.

THE U.S. GOVERNMENT PLANS TO let the contract for building the first atomic powered passenger-cargo ship early this fall and have it at sea in 1960. Specifications provide for a 350,000-mile range with the first load of nuclear fuel. Refuelling would be expected in about three years.

A PROCESS THAT IS CLAIMED TO join carbide to steel in a union strong enough to withstand almost any punch-press operation without separating the intermediary alloy from either the carbide or steel has been announced by Welded Carbide Tool Co. Inc., Clifton, N.J. Two joining materials are used, one as an intermediate material between carbide and steel and the other as a casing material to reinforce carbide inserts.

A LINE OF AUTOMATIC POWER feeds for machine tools is being manufactured by Sandex Automation Inc., Brooklyn, N.Y. For example, a turret lathe installation features a separate feed for each turret position with infinitely variable feed adjustments. This unit indexes the turret automatically and provides fast approach and return feeds.

A DEVICE FOR HIGH - SPEED, automatic elevating, orienting, and feeding of parts to automated production lines or individual machines have been developed by the Gear-O-Mation Division Machine Tool Co., Detroit, Mich. This device uses a combination feeding unit to handle parts that roll or slide, such as gears, cylinders and spiders.

FIRST PRACTICAL APPLICATION of a punched-tape control system to a large three-dimensional milling machine has been built to the specifications of the Martin Co. by the research laboratories division of Bendix Aviation Corp. This new manufacturing system makes use of electronics to put coded information, taken from blueprints, onto tape and then 'read' it in operating a 50-ton milling machine.

THE QUALITY OF GUIDED MISsiles, atomic-powered naval ships, and submarines will be closely checked by a new 2,000,000-volt X-ray installation at the U.S. Naval Magazine, Port Chicago. Concord. Calif. The installation will make possible non-destructive testing of vital defense materials and structures.

Built by General Electric's X-ray department in Milwaukee, the unit is housed in a newly erected concrete building that is large enough to permit entry of an entire railroad car or large truck. The machine packs enough power to radiograph a complete diesel locomotive. Closed circuit television facilities will permit remote observation of internal moving parts to that large, complex operating components can be examined without resorting to costly or destructive disassembly.

A 300-TON PRESS FOR AUTOMATIC progressive production is announced by Minster Machine Co., Minster, Ohio. This is a single-geared centre drive type press. capable of operating in the speed range of 75 to 150 strokes per minute with a standard 3-inch stroke.

A 'SKEW LOADER' THAT ENABLES an operator to load 4200 face-oriented gears per hour onto a gear carrier has been developed by the Gear-O-Mation Division of Michigan Tool Co., Detroit, Mich. Although designed expressly for high-volume heat-treating of gears, the unit is applicable to many other centre-bored parts and production methods.

(*Continued from page* 20)
the physical potential of North America, is the only one which can produce so high a standard of living.

Abundance of time, abundance of consuming power to obtain abundant physical goods, and abundance of opportunity really to **live** will be the bounty of all citizens of this Continent as soon as they tire of the continual struggle to acquire individually their means of livelihood — as soon as they rid themselves of the social blindness caused by the dollar signs in their eyes.

* * *

It has been said that there is much more to life than satisfying the needs for food, clothing and shelter. While this may be so, these elementary considerations must be dealt with before much attention can be devoted to less basic requirements. Thereafter, if there is any time left for him to do so, the citizen can proceed to find out for himself what are some of these other facets of life. In a high-energy civilization requiring as little human assistance as in the case of the North American Technate, he would be free most of his time to do as he wished. What he and his fellow North Americans choose to do with their extensive leisure periods will largely determine how well or poorly they have met the challenge of their economy of abundance.

In a recent telecast on the social effects of automation, Walter Reuther, president of the United Automobile Workers, observed that the increasing application of this technique of production has made it evident that in future people must switch their emphasis from how they spend their working hours to how they spend their leisure hours. While Technocracy Inc. has known this for a long time, it is interesting to hear it admitted finally by so well known a public figure. The trend commented upon by the UAW president was already obvious enough at the end of the First World War to lead to the formation of the Technical Alliance — forerunner of Technocracy Inc. — whose scientists, engineers and economists conducted the extensive research program which resulted eventually in the incorporation of the present Organization. Technocracy, therefore, did not father the trend of physical events which

led to the present state of affairs, but recognized their significance and the necessity of adapting social institutions to them. When that is accomplished, the Organization will have served its purpose and will dissolve. After that, it will be up to the citizenry — including the present enrolled membership of Technocracy — to adapt themselves to the ensuing conditions of abundance.

For a while, then, project your imagination into that science-sponsored era of abundance and contemplate what form of culture might develop from it.

You may have gained the impression that everyone will be engaged in one continuous round of fun and frolic. This seems unlikely, for while most people like to engage in light entertainment periodically, even this becomes tiring after a while, after which they prefer to turn their attention to matters of more consequence. It is primarily out of this second phase of time usage that important cultural contributions to society might be expected to emanate.

Interest in literature, drama and music should take a decided upward turn. Numerous people who showed early inclinations toward creative expression but lacked opportunity for training in their favored media will probably turn to them anew when their chance comes. In order to receive any satisfying degree of social recognition for performance therein, however, they will need to develop their instinct for workmanship to the utmost, for there will be many others striving to meet the high standards set by a discerning public.

The fields of drama and music have intriguing possibilities.

Today, drama societies exist in numerous communities across the Continent, but few experiment with the efforts of new writers. Already operating on a financial shoe-string with relatively inexperienced casts, they dare not take further chances with dubious unknown works. This knowledge, however, adds nothing to the stature of current dramatic art which has suffered severely as a result.

With the problem of costs removed, the situation should be quite different. The provision of ample facilities for dramatic presentations unfettered by fear of their loss through financial failure would make it possible for drama

groups to pay much more attention to the works of new playwrights. There would be many failures, of course, but these would tend to emphasize the quality of the successes. Even these would be more numerous than now due to the multiplications of submitted manuscripts—despite the likelihood of a higher ratio of rejections than now occurs. Consequently, there should be a material boost in the general calibre of productions on stage, screen, television and radio. A similar increase in volume and improvement in standards should result in other fields of literature.

Music reflects very well the temperament of a people at a given place and time according to then prevalent social conditions. It is not surprising, therefore, that much of today's music tends strongly toward noisy and nervous dissonance, reflecting the lack of harmony between our social institutions and our physical environment. Little serious music has been written in 20th Century North America, most of it being extremely frivolous and hard to listen to. There are, however, some notable exceptions which indicate the potentialities now lying dormant in this medium of expression.

Once again, ample time and opportunity should have a telling effect toward growth and development. Removal of the financial stumbling block will enable interested persons to obtain desired instruments and necessary training to match their inclinations. Some may join orchestras, others may become solo artists, while still others may choose to play simply for their own amusement. It may be expected that many will try their hand at composition both in instrumental and vocal fields, either for single selections or for entire musical shows. Just what form the music of a society of abundance will take is conjectural and outside the field of the present discourse, but it should constitute a very favorable reflection.

It is practically a certainty that many Technate citizens will seek to improve their education during their free time. Those with more initiative will be anxious to advance in their respective functional sequences. Every facility will be extended to assist them in their objective, even to the extent of arranging special curricula or schedules to meet their require-

ments. Some, especially eager for promotion, might even devote most of their 78 days' continuous vacation period to such functional training. Nor is it inconceivable that some people with specialized training may choose to use part of their spare time to instruct others in their particular fields. Retired citizens may be similarly inclined to pass on the benefit of ther experience to younger citizens through the medium of the Education Sequence.

Emphasis on use of spare time in a society where leisure has become a dominant factor will be toward participative rather than vicarious interests. Even today, despite continuing heavy attendances at professional ball games, race tracks, etc., there is growing interest in activities that involve more doing than watching. Hence the greater number of people engaged in hobbies of various types than was the case a few years ago. Many of them also participate in group sports such as bowling, curling, and inter-company baseball or hockey contests. What has freed them to do so? Certainly there has been no legislation passed prohibiting such activity, so the reason must lie elsewhere. It can be found in the shortened working hours resulting from the increased application of technology to an ever-widening scope of functions. When the average work week was sixty hours or longer, few employees cared about anything other than getting home, eating, then going to bed to rest up for the next strenuous day. Subsequent gradual drops in the length of the work week gave them more time to themselves, but it is only in the few years that average time on the job has been under forty hours weekly that they have had much inclination to engage in functions that drew upon reserves of energy not used up in their jobs. It may be expected, therefore, that this trend which is all for the good will develop further in relation to the continuing decline in the use of manhours.

* * *

What has been said about the potentialities of life in a Technate is an insignificant fragment of what could be said and of what in course of time may happen. We can do no more now than indicate some of the possibilities of an era wherein leisure time has become more important than work.

Are the people ready for such an era? Will it be good for them?

These are questions Technocracy does not presume to answer. The thing is that the physical trends on this Continent all point in the direction this Organization has been long indicating—namely, a minimum work week and optimum living standard. Since time immemorial man has dreamed of having such an opportunity as has finally come to the people of North America.

They can make of it what they will — history's finest civilization or its greatest debacle.

—Rupert N. Urquhart

★ CAMBRIDGE, Mass.—An electronic brain has been developed that will take much of the drudgery out of running a department store.

Harold D. Hodgkinson, executive head of William Filen's Sons Co., described the new device at the Harvard Graduate School of Business and Administration.

The 'brain' is a small box-like gadget with a few keys. It even includes a small red bulb which lights up if the customer's credit is unsatisfactory. It keeps charge accounts up to the moment.

The executive said the device, known as 'Bizmac,' will 'take the drudgery out of retailing, freeing the merchant for creative thinking, not the laborious tabulation of sales and inventory figures.'

The machine will help sales girls, store management and customers, Hodgkinson said.

He said the 'brain' will 'advise us not only what to buy, in what quantities, when and at what price, but also aid in such problems as the prompt tabulation of counter sales.' *—International News Service*

★ LYTHAM ST. ANNE'S, Eng.—A hard-working mechanical brain named Ernie was used to select the first winning number in Britain's 'thrill bond' lottery.

Flashing his single green eye and uttering a metallic grunt, he set about selecting 23,000 winners in the first payoff on the government's $72,000,000 premium bond sales program.

Ernie, short for electronic random number indicator equipment, settled down to a steady rate of 1300 winners an hour. *—Reuters*

★ OTTAWA—The number of business failures reported in Canada in 1956 increased to 1,966 from 1,795 in 1955.

The greatest number of failures occurred in Quebec where bankruptcies increased to 1,265 from 1,180.

Bankruptcies in other provinces for 1956 with 1955 figures in brackets: Ontario 507 (406), Manitoba 23 (27), Saskatchewan 34 (37), Alberta 41 (42), British Columbia 59 (67), Atlantic Provinces 37 (36). *—Canadian Press*

★ WASHINGTON—The army believes it has figured out a way to use solar batteries to power helmet radios even when the sun is not shining.

In sunny weather solar cells provide direct power and charge four small nickel-cadmium storage batteries which provide power at night or in cloudy weather.

—Associated Press

Conspicuous Consumption: 1957

America has changed since the hansom-cab days of Veblen. Yet much truth still attaches to the idea expressed in his The Theory of the Leisure Class *that people spend money, time and effort quite uselessly in the pleasurable business of inflating their egoes.*

HALF A CENTURY ago a familiar figure on the campus of the University of Chicago was a rumpled-suited professor who mumbled in his beard, insulted his students, plagued the university trustees and was constantly thinking up new theories. The professor was Thorstein Veblen, coiner of the phrase 'conspicuous consumption,' a phrase that has become as integral a part of the compleat intellectual's verbal baggage as, say, Freud's 'Oedipus complex.'

America has changed since the hansom-cab days of Veblen. Yet much truth still attaches to the professor's idea, expressed in his 1899 classic, **The Theory of the Leisure Class**, that people spend money, time and effort quite uselessly in the pleasurable business of inflating their egoes; that people spend simply to show they **can** spend. The theory is double-barreled. Rich people lord it over their pecuniary inferiors by wasteful expenditures, while the inferiors copy the practice to improve their own status.

The unparalleled level of postwar installment buying has enabled the wage-earning American, far more than in Veblen's time, to gratify his bent for wasteful luxury in imitation of the idle rich. By the end of 1956, pay-later Americans owned a record $31,552,000,000 in easy payment debts representing millions of automobiles, refrigerators, garbage disposals, storm windows and cruises to Bermuda. One need not swallow Veblen whole as a fundamentalist swallows the Scriptures. Many people do not engage in conspicuous consumption at all. But many do. And much that appears to be conspicuous consumption may be explained in other ways. But much can't.

Not so long ago a Beverly Hills furrier advertised mink bras and

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Reprinted from THE NATION.

panties in thirty different mutations at $2,500 a set. Simultaneously, a New York store marketed a spray gun, coated with gilt and trimmed with b e e s and flowers, which sold for $7.98. A hardware-store gun cost only 69 cents.

Veblen warned that people are prone to disguise wasteful spending by s p e n d i n g it on objects which appear to have some use: 'Even in articles which appear at first g l a n c e to serve for pure ostentation only, it is always possible to detect the presence of some, at least ostensible, useful purpose. . . .' To elaborate this thesis, a look at an advertisement running currently in **The New York Times** and some of the more fashionable magazines is instructive. The advertisement s a y s: 'Ah! The Luxury of a GOLDEN TOOTHPICK For t h e Woman Who Has Everything 14K Gold "T o o t h pique" Beautifully Engraved and Set With a Ruby $15 For the Man Who Has Everything 14 K G o l d Unadorned $7.50 Each With a Leather Case.' Quite clearly, t h e w o m a n who has everything is twice as expensive as the man who has everything.

Waste, Veblen said, shows up in needless expenditure of time as well as money. Illustrative of this point and reminiscent of the Great Gatsbian twenties is this item from the March 29, 1954, issue of **Time:**

'On Sunset I s l a n d No. 1 in Miami's yacht-clogged Biscayne Bay, Marianne Reynolds, who got $2,000,000 and a divorce in 1952 from Tobacco H e i r Richard J. Reynolds, Jr., sang a $35,000 swan song. S o o n off to luxuriate in California, Marianne s a i d farewell to Florida in the style to which Reynolds has accustomed her. Under the bleak gaze of ten gate-guarding cops, 160 servants, two firemen and some fifteen dinner-jacketed plainclothesmen who mingled but did not fraternize, about 300 g u e s t s jammed for warmth (evening temperature: 48°) into two satin-draped tents pitched on Marianne's lawn. They guzzled 200 bottles of pink champagne (price: $11 a fifth) and torrents of other beverages, ate their way through flocks of guinea hens and a whole salmon (length: 1 yard), gaped at one buffet display featuring a woolly lamb surrounded by genuine lamb chops. The swan-song theme was carried out by a d o z e n h u g e swans, carved from ice, which graced the

tables, plus flocks of smaller black-metal swans dangling from trellises in the yard. While a dance band (Tommy and Jimmy Dorsey's), a rhumba outfit and an eight-woman string ensemble blared and sawed away, Marianne, all in pink with a diamond tiara, held court in a bower of pink flowers. Said she, as the new day dawned and the icy swans began to melt a bit: "If I had known it was going to be so cold, I would have had the tents draped with pink mink."'

The professor found that a society has to progress beyond the chronic scarcity stage before any of its citizens can drape a tent with pink mink or in any way waste time and goods. The United States in 1957 is beyond the scarcity stage. Life is abundant for most, so a few can stop work, clip coupons and consume conspicuously. With profits at all-time highs, big-business executives, casting about for ways to spend their money and influence their friends, are offered a variety of high-class, high-priced goods. Effete gifts advertised last Christmas season for tycoons included a pair of musical cuff links containing 'the world's tiniest music box, formerly available only to Royalty at fantastic prices' marked down to $100; a tiny scale-model steam engine for the executive who is a 'frustrated engineer' at $195; and an 18-karat gold shaving bowl for $2,250. For the well-clad executive with aspirations above the gray flannel suit, **Esquire** this spring is advertising a $595 sport shirt made of Vicuna wool; the buttons are gold with sapphire inserts. Other rarities for the mogul: a Vicuna wool dressing gown tagged at $750; a jigsaw puzzle for $350; a black pearl shirt stud at $3,500; a fountain pen in a gold case with a sapphire on the top, $390; a set of cuff links with 'modest-sized' emeralds less modestly priced at $590; a pocket watch which tells the day of the week, phase of the moon, date of the month and year, and strikes the quarter hours in pretty chimes, at $12,000.

Much prestige attaches nowadays to the man who earns his bread by using his 'head' instead of his hands. Mechanization is converting more and more soiled-shirted wage workers into fresh-suited and white-collared salary earners. The $70-a-week office clerk emulates the $7,000-a-year

junior executive who, in turn emulates the $50,000-a-year firm president. Status, prestige and success emerge as the new Holy Trinity.

Women join men in the emulative chase. They can buy $40 elkskin shorts and can scratch their backs with a $6.95 gilt, pearl and sea shell-encrusted back scratcher adapted from the standard 39-cent Chinese model. To emulate Fifth Avenue women who can pay for high-tone items, millions of others spend more than they should for up-to-date apparel. Brides, in particular, tend toward 'formal and expensive finery,' according to a February 4, 1957, article in **The New York Times.** The article predicts that:

'. . . The career girls who marry this year will spend an average of $200 to dress themselves for the ceremony — from underpinnings to veil. In some cases it is well beyond what a realistic budget would allow, but the girls accept the expense with pleasure. "More often than you would think, the girl who lives in a coldwater flat is the most extravagant bride," said one bridal consultant.'

The extravagant bridal costume allows a working-class woman to act like an upper-class debutante, if only for the duration of the ceremony. As Veblen observed: 'It is true of dress in even a higher degree than of most other items of consumption, that people will undergo a very considerable degree of privation in the comforts or the necessaries of life in order to afford what is considered a decent amount of wasteful consumption. . .'

The girl who lives in a coldwater flat is more fortunate than was her counterpart in Veblen's time. Fashions, once high-priced and exclusively for the rich, are now widely copied, mass-produced and sold at prices within tip-toe reach of the working girl. The tight-skirted, smartly-hatted, high-heeled (and presumably well-heeled) woman one sees in the morning subway rush may well be a tenement girl on her way to a box factory. Until she gets there she is a lady whose clothes are so confining that they suggest she could do no manual labor even if she chose. When she arrives at the box factory, she changes her dress for a frock, her high heels for pumps, her hat for a kerchief, her pride for practicality. At lunch she may do with

a jelly sandwich instead of ham to save toward the purchase of additional ladylike clothes. In the summer the cold-water flat girl can take a vacation to an expensive resort, a swank hotel, a first-class cruise — places where she can buy, if only for a week or two, the feeling of leisure-class status.

Conspicuous consumption is not always vulgar display. Often it is subtle and almost always it is rationalized as 'necessary' expenditure. For instance, the shutter bug can get an imported Swedish Hasselblad miniature camera outfit that retails for $1,850.55. The golfer is offered a set of four mink mitts to protect the heads of his golf clubs, at $135 a set. The dog owner can get his poodle a solid oak, brass-bound brandy keg with a leather harness for the animal's neck, at $10; a terry-cloth bath-rob for 'a dog who shivers after his bath,' $7.50; a dog raincoat, $9.95; or, for a dog's proper sleep, a maple-furnished four-poster bed and mattress, both for $39.50. The gracious hostess can adorn her dinner table with a $125 asparagus server, prepare highballs with the aid of ice buckets which start at one store at $65. The 'art lover' can impress visitors with a fifteen-inch, $295 statue of General Ulysses S. Grant which can smoke cigarets.

But without doubt, the single most woeful example of incredible waste is the automobile. The 1957 model is long, wider and gaudier. Its enormous hulk is propelled by a hot-blooded engine of 300 horses. Its rear fenders are upswept, backswept, high-flying jet fins—ocular insults and absolutely useless. It is laden with a smorgasbord of accessories; vent ports that don't vent, three-tone needlepoint-plastic upholstery, triple-tone finishes, pounds of ornamental chromium. Motorists love to say they wish the auto companies would not put so much junk in the cars, yet they continue to buy the 'de luxe' or chrome-trimmed line at higher prices.

Fashion in cars has become like fashion in women's dresses. Get a new one each year or you're plunk out of style. Daily, the auto manufacturers preach the gospel of trading in last year's model for this year's. Admits Paul Garrett, vice president in charge of public relations for General Motors: 'The automobile industry's pattern of antiquating old things by

creating new reflects the dynamics of our country's growth better than anything I know.'

The magnates who make Cadillacs are obvious in their appeal to blatant snobbery. Says an advertising blurb beneath a drawing of a Cadillac parked at the side of a columned mansion:

'Pride of the Neighborhood!

It is a happy occasion indeed when a new Cadillac car first appears in the driveway of its proud and happy owner. . . .

'In fact, the car invariably becomes a source of genuine pride and satisfaction throughout the entire neighborhood in which it resides.

'The neighborhood understandably delights in having a beautiful new Cadillac to grace its streets . . . and takes great pleasure in knowing that one of its own has been able to realize the dream that lives in the hearts of so many.'

As **Life** magazine observed in an article on cars in its January 18, 1954, issue: 'In American culture the automobile has not merely replaced the horse; it has in some degree replaced the home, at least as the most important cachet of social and economic position. (Groups of small wage-earners have been known to pool their resources and buy one new big car, each driving it one day a week, rather than buy the used cars they could afford on their own.)'

The **Life** article recalled a survey which Ford made some years ago. The test consisted of two parts. In the first part, 'hundreds of motorists were asked simply what they wanted most in an automobile. The commonest answers were "dependability" and "safety." Exterior appearance was far down the list in eighth place. Now the pollsters asked a second, similar group the question but in another way: "What, in your opinion, does **your neighbor** most want in a car?" This time the answer "flashy appearance" moved into second place. The public was an accurate judge of the public; it was only when each individual was asked what he himself wanted that he substituted how he thought he **should** feel for how he **really** felt.' (Emphasis is **Life's.**)

Americans don't like to admit that many of them are mixed up in the emulative chase, that they waste time and money to

impress others. Until they do, and do something about it, the ghost of the old Chicago professor will continue to rattle his chains across the land.

—A. K. MacDougall

★ GRAND JUNCTION, Colorado—American Gilsonite Co. has announced it has broken the synthetic fuel barrier and said its development has added the equivalent of a major oil field to U.S. petroleum reserves.

T. F. Goodner, president, said crude oil can be produced from the shiny black coal-like substance—Gilsonite—for 'considerably less than $1.87 a barrel' against the current price of between $2.20 and $4 for crude oil.

The development marks the first commerial production of oil from a solid mineral and in effect means oil now can be mined as well as drilled.

Goodner's remarks came during the formal opening of a new $15,000,000 refinery here where the breakthrough is actually made.

The refinery turns out Gilsonite-derived gasoline that will be sold within a 100-mile radius of the Grand Junction area, and high grade metallurgical coke which will be bought by the aluminum industry in the northwest.

From the Gilsonite also are extracted the fuel oil necessary to power the plant.

American Gilsonite, owned jointly by Standard Oil Co. of California and Barber Oil Corp., has 'at least' 16,000,000 tons of Gilsonite—the equivalent of 100,000,000 barrels of oil in the Unitah basin of eastern Utah. *—United Press*

★ GENEVA—Claude Jodoin, president of the Canadian Labor Congress, said here that the utmost must be done to protect the legitimate interest of workers who will be affected by automation and the use of atomic energy.

He opened the general debate of the International Labor Organization conference and said he was 'fascinated by the almost magic-like aspects of automation and the use of atomic energy for peaceful purposes.'

'We fully share the hopes of mankind for its beneficial potentialities.'

However, he warned that protection is needed for 'those wage earners who will be the first to be affected by this newly developing trend.' *—Associated Press*

★ OTTAWA—Consumer credit outstanding at the end of May in Canada was 2% above a month before and 15% higher than a year earlier, according to a survey of main items by the bureau of statistics.

The total was $1,286,000,000 against $1,259,000,000 in April and $1,117,000,000 last year.

Sales finance companies had $782,000,000 outstanding against $757,000,000 the previous month-end and $659,000,000 at May-end last year. *—Canadian Press*

★ EDMONTON—Complicated mathematical problems that would take physicists at the University of Alberta weeks to solve now can be solved in a matter of minutes through a direct teletype hookup with an 'electric brain' at the University of Toronto.

Dr. G. K. Norton of the University of Alberta physics department officially opened the teletype circuit by feeding a ticker tape with a problem 'punched' on it into a teletype machine on the campus. *—Canadian Press*

★ WARSAW, Poland.—A factory in Silesia is turning out a multi-purpose machine that can whip cream, prepare cakes, squeeze fruit juices, cut bread, grind coffee and wash dishes. *—Reuters*

Black Is White

A dissertation on Usury, based on the double-talk which has been voiced by economic theorists and moralists throughout the period of Modern History.

WHEN A PERSON saves his money, he is depriving himself of the goods things of life which that money would buy in order to provide himself with the wherewithal for s u r v i v a l and comfort at a later date. This may turn out to be an act of wisdom on his part, since society does not guarantee one the means of livelihood and welfare in the event of sickness, misfortune, or old age. It is often expedient that one set aside something in times of plenty to carry him over times of scarcity. But, in doing so, one subjects himself to the risk of never benefiting from that which he saves.

If one should store food or fuel or fiber for later use, one would not expect it to increase in volume or quality with time; rather, there is some risk of loss involved, for the stored material may deteriorate, be damaged, or be destroyed by one means or another. One has to expect such possibilities and when they do come accept one's loss graciously as an act of fate.

The same principle would apply to money. If, instead of saving goods, one saves money, he does so at some risk. Among the possible contingencies are these: The money may depreciate in value and not buy as much as when one put it away. It may become lost, destroyed, or stolen. Or it may cease to be negotiable, d u e to changes in government, revisions in governmental policy, or lack of federal solvency. So, when one saves money rather than spending it, he is taking a calculated risk —a risk that he may suffer a net loss in the long run. If one does not consider this possibility and condition himself to an acceptance of the worst, should it happen, he fails to be realistic; he leaves himself open to tragic consequences.

But it also happens there are people whose needs or improvidence is such that they feel called upon to spend more than they have at the moment. To satisfy this demand they may seek to

borrow from others that which these others have saved. In doing so, they promise to repay it at some later date. Since he who has been saving his money is not using it at the moment, he may be inclined to assist his neighbor over the period of difficulty by loaning him some of his savings. This is a generous act on his part, but he must recognize that it entails some added risk; namely, the borrower may not be able or willing to repay the loan. Hense, he who loaned the money may never get it back. This may be a deterring factor with respect to making the loan, and often is.

This reluctance to loaning money may be overcome to a greater or lesser degree if the borrower promises to return more money than he receives on the loan. But this introduces a whole new economic and moral complex of factors.

For one thing, the lender, in expecting back more than he gives, is seeking to acquire an income which he has not earned. In effect, he becomes a parasite, capitalizing on the misfortune of his neighbor. This economic and moral principle is in no way alleviated by defining different degrees of parasitism and giving them different names; for example, naming one degree 'usury' and naming a lesser degree 'legitimate interest.' Nor is the principle changed when the loaning and borrowing is conducted through an impersonalized institution, such as a bank.

If, however, one were to use his extra money for the purchase of farmland and then raise crops for sale, he would stand a reasonable chance of increasing his wealth; but, we must recognize, this would not be pure gain, for one's labor would also go into the process. But, if one should hire the work done, thus giving needed employment to others and permitting them, thereby, to earn a living, he may still come out ahead financially. And society would not condemn him if he should do so. It is a legitimate and essential phase of the economic system which mankind has cherished for centuries.

But, on further consideration, one need not be limited in his investment opportunities to farmland. He might, instead, put his money into housing to be rented to those who need a place in which to live, but who do not see fit to

purchase a home of their own. Rent, so long as it is reasonable, is a justified charge, for housing property is subject to deterioration, needing repair and upkeep; then, there are taxes and possible litigation. An increment on such investment should not be considered any less moral or deserved than a similar return on cropland. Besides, it fulfills a social need.

With such a background of economic precedents to proceed from, one must also concede the justification of investment in transportation equipment and rights of way, which serve a needed function in society, providing service for which the people are glad to pay a nominal fee. This same principle can be extended to other service functions and to plants and equipment used to produce goods required by the people.

Now, suppose one has the money to invest in such enterprises but is not able to handle the management of the enterprise himself. Should it be considered amiss for him to hire someone to manage the enterprise for him? It would be no different than the farmer hiring a man to help him with his work. Extending the procedure a little further, one might pool his money with that of other savers and let the investment be handled by a professional group organized for that purpose; a financial corporation.

Since it is not practicable for one to know ahead of time the nature and degree of the risks one takes in the investment of money, and since it is much simpler for all concerned for one to ask a standard rate of return that will compensate him for any probable loss, a fixed fee is a practicable procedure. If it turns out that the risk is less than allowed for, the investor may be a little ahead of the game.

Social progress ensues from the investment of savings in projects of social usefulness, particularly those that would not be entertained otherwise. Hence, if people happen to accumulate savings, either through going without the things they would otherwise purchase or by acquiring more income than they need to satisfy their wants, they are contributing to social progress, and it would seem to be only fitting and proper for them to be rewarded for their generous financial help—especially when we take into account the risk involved. As the society gains

economically, so should all those who helped to make that gain possible.

If one invests his money, whether it be in farmland, rental housing, or some other useful project, and thereby deprives himself of its immediate benefits, who should complain if the outcome of his investments are beneficial to him? The same opportunity is open to everyone in the society. Further, if the income from one's investment are not needed for making purchases, one is fully justified in plowing them back into further investments, he may acquire a sizable fortune for his later years.

Should one pass on from this life before he has had time to spend his income, naturally it should be his privilege to decide how and by whom it may be spent. If he specifies that it be kept in trust for his heirs and their heirs, ad infinitum, it is his privilege, and it should be repected by society. In such an event, if the family fortune is wisely administered from generation to generation, it may continue to grow in volume, and the family will become increasingly wealthy and powerful. Conceivably, a family could develop such a fortune from investments, over a number of generations, as to become one of the most powerful families in the world.

He who gains from wise investment of funds tends to advance socially, economically, and politically over those whose misfortune, improvidence, or poor judgment causes them to suffer a loss. Thus, financial wealth becomes the real gauge of social success; and it is only natural that one should want to become successful and respected in his community. It is not possible for one to earn such respect through his labors; rather, one must depend on acquiring it through unearned income. There is no more efficacious or satisfying way in which to gain an unearned income than through letting your money work for you.

He who does not save and make his savings work for him is either ignorant, stupid, or indifferent about his own welfare. The deserving are those who know how to look out for themselves and take advantage of those situations which most enable them to enhance their wealth. Truly, the shrewd shall inherit the earth and all that's in it. **—Jess Ewitt**

Who Is Inferior?

There's plenty of talk today about the problems of 'automation.' Let's not forget that the main change is this: now we can, for the first time, get rid of the joe-jobs without kidding ourselves that someone else is inferior.

EVER since the dawn of history, Man has been trying to get rid of the joe-jobs — the tedious, repetitive tasks that consume time and energy out of proportion to results. Only in eras when large numbers of people have been able to free themselves from joe-jobs have there been any significant advances in civilization.

Until recently, the standard method of getting out from under these tasks was to find someone else to whom they could be handed. In Greece, the cradle of democracy, the standard of living and the leisure of the citizens was founded on the labor of slaves. In Western Europe, during the Renaissance, serfs, peasants and the like did the joe-jobs. During the spacious days of Queen Victoria and King Edward, the joe-jobs were done by human beings who were not technically slaves but whose lot in life wasn't much better.

All of these solutions to the problems of providing leisure depended on the ability of human beings to convince themselves that other human beings ought, as a group, to be stuck with the joe-jobs. It was a theory of race, or a theory of class, or some variation of the notion of natural superiority.

The advances of modern psychology, plus the liberal philosophies hammered out in periods of leisure, have made it difficult to sustain this notion. Differences of talent and training obviously exist between man and man—but differences in kind are becoming less plausible.

Fortunately, there is a way out of this dilemma for modern man. We can use the machine for the joe-jobs. In essence, automation, if it means anything, means release from the tedious, repetitive tasks.

This is a welcome development of infinite importance, and the fact that it brings changes should-

n't be allowed to mask the basic advance involved in the increased use of machines. Any change — from slaves to serfs, from coal to oil, from sail to steam — creates problems and arouses opposition. Those who have most to gain from change are frequently the fiercest opponents.

These days, there's plenty of talk about the problems of 'automation' and the dangers that may arise out of sweeping changes in the way we work. Let's not forget that the main change is this: now we can, for the first time, get rid of the joe-jobs without kidding ourselves that someone e l s e is basically inferior. That change is pure gain. **—Financial Post**

★ FACTORY LABORERS are not the only ones who have to worry about automation stepping into their jobs. From all indications, the New York Drama Critics Circle may be next. After that, who knows? Maybe editorial writers.

What the drama critics have to keep a wary eye on is a machine called Televac, a sort of Univac of the straw-hat circuit. This electronic Brooks Atkinson, which we think should be renamed Unicritic, is still having its out-of-town tryouts, but Broadway had better beware.

The machine is set up to measure boredom on a continuous basis during a theatrical performance. Its first test in the hinterlands (Connecticut) is being held at the Westport Country Playhouse, where Hume Cronyn and his wife are bravely playing to an audience that will have 100 of the boredom indicators at hand.

We know already what the results of this opening night are going to be. No one in the house will be bored but the actors, who will have to put up with an audience fascinated by manipulating their Unicritics.

However, as soon as audiences become bored with the gadget and return their attention to the stage, Unicritic should come into its own to help playwrights, directors, and actors spruce up new plays. It's then that the human critics (most of them are human) have to watch out. Their best defence, we think, is just to vote the new electronic pundit into their circle. *—Christian Science Monitor*

★ ON A REALLY long-term view the basic problem for human society is adjustment to the new environment being produced by scientific progress.

Thousands of years ago the development of organized agriculture provided the material basis which made civilization possible, and until recently all civilizations have had a basis of peasant agriculture.

The development of science and technology which has been accelerating for the past 200 years or so may well prove to be a similar shift in the trend of human development. *—Michael Lindsay in New Republic*

★ OTTAWA—The number of Canadians without jobs totalled 162,000 during the latter part of June, the bureau of statistics has reported.

This figure is an increase of 45,000 over the corresponding period a year ago. *—Canadian Press*

TECHNOCRACY

NORTH AMERICA'S ONLY SOCIAL DYNAMIC

WHAT ?

★ Technocracy is the only North American social movement with a North American program which has become widespread on this Continent. It has no affiliation with any other organization, group or association either in North America or elsewhere.

★ The basic unit of Technocracy is the chartered Section consisting of a minimum of 50 members and running up to several hundred.

★ It is not a commercial organization or a political party; it has no financial subsidy or endowment and has no debts. Technocracy is supported entirely by the dues and donations of its own members. The widespread membership activities of Technocracy are performed voluntarily; no royalties, commissions or bonuses are paid, and only a small full-time staff receives subsistence allowances. The annual dues are $9.00 which are paid by the member to his local Section.

★ Members wear the chromium and vermilion insignia of Technocracy — the Monad, an ancient generic symbol signifying balance.

WHERE ?

★ There are units and members of Technocracy in almost every State in the U.S. and in all Provinces in Canada, and in addition there are members in Alaska, Hawaii, Panama, Puerto Rico and in numerous other places with the Armed Forces.

★ Members of Technocracy are glad to travel many miles to discuss Technocracy's Program with any interested people and Continental Headquarters will be pleased to inform any one of the location of the nearest Technocracy unit.

WHEN ?

★ Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers and economists that become known in 1920 as The Technical Alliance — a research organization. In 1933 it was incorporated under the laws of the State of New York as a non-profit, non-political, non-sectarian membership organization. In 1934, Howard Scott, Director - in - Chief, made his first Continental lecture tour which laid the foundations of the present nation - wide membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing.

WHO ?

★ Technocracy was built in North America by North Americans. It is composed of North American citizens of all walks of life. Technocracy's membership is a composite of all the occupations, economic levels, races and religions which make up this Continent. Membership is open only to North American citizens. Aliens and politicians are not eligible. (By politicians is meant those holding elective political office or active office in any political party.)

★ Doctor, lawyer, storekeeper, farmer, mechanic, teacher, preacher or housewife — as long as you are a patriotic North American — you are welcome in Technocracy.

TECHNOCRACY

Whatever the future of Technocracy, one must fairly say that it is the only program of social and economic reconstruction which is in complete intellectual and technical accord with the age in which we live.

—**Encyclopedia Americana**

TECHNOCRACY DIGEST

NOV. 57

Let There Be Satellites

A High Standard of Living?

The Fantasy of Limited War

Chemical Analysis by Pushbutton

The Threat of Abundance

A Whale in a Pail?

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A Power Complex

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STAFF

DONALD BRUCE.....*Editor*
MILTON WILDFONG.....*Assistant Editor*
RUPERT N. URQUHART, *Assistant Editor*
ED BRODERICK.....*Assistant Editor*
JANE URQUHART....*Circulation Manager*
HELEN SLATER.....*Business Manager*

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The Quarterly Survey

Economic Insanity

The economic insanity of the North American Price System was revealed again recently in a problem faced—and solved, after a fashion—by U.S. Agriculture Secretary Ezra Taft Benson.

To avert a threatened collapse in hog prices next year, Benson offered to support this year, at $1.10 a bushel, any and all corn grown by Corn Belt farmers who ignored the Agriculture Department's acreage controls (for farmers who complied with controls, the support price is $1.36).

He was 'sorry,' Benson said, but he just had to take the step, because if free-market corn prices fell too low, farmers would take advantage of cheap feed and raise so many piglets that a hog glut would result.

Benson might have added that the cheap-corn threat is a result of the chronic corn surplus, which in turn is a result of the price-support program. Which all goes to prove that price and plenty are absolutely incompatible, as Technocracy has maintained right along.

Life's New Series

The October 7 issue of **Life** contained the first of a series of articles on 'Man's New World.' Entitled 'Frontiers of Technology,' the article deals with man's new factories and laboratories in which he is studying or putting to use materials he has just made or discovered and methods he is still learning.

The magazine's November 11 issue will feature 'Frontiers of

Fitzpatrick in The St. Louis Post-Dispatch

Better Turn It On, Chief

Living,' covering the effects of technology on home and community. **Life** has announced that succeeding chapters will take up 'Frontiers of Health,' 'Frontiers Beyond the Earth,' 'Frontiers of Thought,' and the problems of technology and human society.

Technocrats will be particularly interested in the last mentioned article. As the pioneers of science in the social field, Technocrats will be waiting to see if **Life** really comes to grips with 'the problems of technology and human society.'

Unemployment Up

Canada's unemployment total jumped by 20,000 during September to 194,000, the federal government has reported.

The jobless represent 3.2% of the labor force, almost double the 1.7% a year ago.

At the same time there were 5,854,000 persons with jobs, a drop of 103,000 from the August record total of 5,957,000.

Britain's Crisis

Britain's Conservative Party came into office six years ago pledged to give the nation back 'a free-market economy.' It was the Conservatives' promise to replace Labor's 'welfare state' with what Prime Minister Macmillan has called 'the opportunity state.'

"You Said It, Pal—We Both Got a Right to Poison the Air"

Now the Conservatives are in serious economic trouble — so critical that they are restricting economic opportunity in Britain. Inflation has caught up with the Tories, as it did with Labor, and it has produced another of the U.K.'s postwar exchange crises. To avoid having to devalue sterling, the Macmillan government is restricting the money supply drastically, even at the risk of unemployment.

Let There Be Satellites

What should have been hailed as a great technological breakthrough has been received with dismay by the official circles of the United States. Many American scientists did rejoice at the Russian achievement, but they did not represent the official 'party line.'

FOR SEVERAL YEARS past, there have been technical discussions and work dealing with the problem of launching an artificial satellite into space above the earth's atmosphere. Both the Russians and the Americans were giving the idea serious consideration. Both were giving out news releases on their thinking and on what they were doing and on how well their work was progressing. Both announced that a data-gathering satellite of small size would be put aloft during the International Geophysical Year, now in progress.

The Americans announced that their satellite would be ready for launching in September, 1957; then, it was postponed to sometime in the spring of 1958 for technical reasons, presumably connected with the development of a launching device.

In June of this year, the Russians announced that they had a satellite and the launching mechanism all ready and that the satellite would be sent into space sometime before the end of 1957. Pictures of both the satellite and the purported launching rocket were published and available to American Intelligence. The satellite was given the name, Sputnik.

The American 'experts' on Russia, being supplied with information from the Central Intelligence Agency, pooh-poohed the Russian claims. 'Everybody knows' that Russia is a backward area; that it has no technical ability; that it is godless and corrupt. The Russians are incapable of telling the truth, so whatever they say must be a lie; therefore, they had no satellite and no missile launcher. It would be many years before they could possibly have one, possibly never; at least not until after spies and traitors had stolen the plans from the United States and the captured German scientists had interpreted

the data and designed the equipment.

This is the type of information that was being fed to the political administration of the United States by the 'experts,' and this information was being accepted as a basis for national policy.

On October 4, 1957, the Russians announced the successful launching of Sputnik. It would have been laughed off as a propaganda trick, except you can't laugh off a thing that orbits overhead every 96 minutes giving off a 'beep - beep - beep' signal. That launching of the Russian satellite came as a 'complete surprise.' The news services, lacking prior briefing from the propaganda agencies, played the event straight.

The Soviet success required an official 'explanation,' and such was not long in coming: The Russians stole the secret of the satellite from the United States! Now, it would seem, the 'explanation' also needs an explanation: to wit, how can one party steal an invention from another party before the second party has invented it? That is some of the best stealing we have ever heard of; and, if the technique can be perfected, it has unlimited possibilities.

What should have been hailed as a great technological breakthrough was received with dismay by the official circles of the United States and by its political allies. The Vatican was very gloomy. Many American scientists did rejoice at the achievement, but they did not represent the official 'party line.'

It soon became evident that the real interest in developing the satellite had not been for the purpose of obtaining scientific information or for achieving a technological success, but the chief interest revolved around military considerations. The main purpose of the satellite, at least in America, was to gain more accurate data for launching atomic missiles at targets in time of war. It is supposed that the Russian emphasis was of similar portent. The American aim in sending up a missile-satellite was to gain photographic data of Russian territory so that target areas for the forthcoming intercontinental ballistic missile could be pinpointed. .It was blatantly proclaimed in America that long range missiles, equipped with Hydrogen explo-

sives, were being readied for the Eisenhower Crusade, whose purpose is to bring the East under the domination of the West, thereby freeing the nations of East Europe and opening the territory of the Soviet Union to American 'free enterprise' exploitation.

Now, the Russians have succeeded in sending up their satellite ahead of us, and both our prestige and our hopes are in the doldrums. For one thing, Americans fear that the Russians are obtaining secret information about the United States by means of radio code messages from Sputnik. Why not, isn't that what we were getting ready to do with respect to Russia? But, what is worse, the Russians must also have an ICBM; they would require one or an equivalent device to launch the satellite. In other words, they have stolen the secrets of our long range rockets and built operational copies before we have been able to develop one ourselves.

The sad fact is: The United States has been reduced to Number Two position in military potential, at least in the eyes of the world.

In the frantic search for a scapegoat for our failure, our political spokesmen have settled upon certain vague Russophiles in high government positions who have been methodically withholding funds from both the satellite and the missile programs, thereby giving the Russians a relative advantage. In order to get anywhere, America needs dollars and lots of them. (The Russians, not being dependent on dollars, evidently are not handicapped in the same way.) This explanation is, of course, an outright hoax. The United States has spent **billions** of dollars on its missile program. Some $700 million was spent on the Navajo rocket alone before it was abandoned. Similar amounts are being spent on other rockets and missiles.

In spite of assurances from the president and others that the United States is not alarmed over the Russian success and that our program will 'continue on schedule,' there is much frantic yaketyyak going on behind closed doors. You can be very sure that, within a very short time, the United States will be firing various kinds of missiles into space beyond the atmosphere of the earth — and

they won't be fired 'on schedule' either. They will be launched (or attempted) at the earliest possible moment. Further, just to show the world that we are 'really ahead of the Russians,' we will try to send up bigger and better satellites, and to higher elevations, than Sputnik.

The race to satellitize outer space is on. There is no reason to believe that the Russians are standing still, resting on their first achievement. We must presume that their spies are still very busy stealing all our new secrets so they can keep ahead of us. The next objective will be the Moon, then Mars. Why should anybody be in a rush to get to the Moon? To gain a military advantage, what else?

Along with the developing decline and crisis in the economy of the West, the urgent need for starting World War III will become more and more apparent—as evidently it is already apparent to Mr. John Foster Dulles. American statesmanship, operating under Divine guidance via the Vatican, can think in no other terms. So, outer space will have to be filled with satellites; also anti-satellites and anti-anti-satellites. Our free society must win out over the totalitarian 'slave society' of Russia, even if the West must resort to totalitarian regimentation to do so.

While small minds are permitted to rule over human affairs, there will be no peace in our time. Small minds think mostly in terms of destruction. Scientists and technologists think in terms of discovery and the positive application of knowledge to human use. The future of the world and of mankind rests on the speed with which the administration of human affairs shall be wrested from politicians, businessmen, ecclesiastics, and journalists and brought under the control of technical people.

—Techno Critic

★ WASHINGTON — Russia is expected to follow up its earth satellite with announcement soon of an atomic railway locomotive and the harnessing of solar energy to generate electricity.

Soviet scientists have clearly indicated they are applying new technology to industry and are not reserving it solely for their military program or 'pure science.'

—British United Press

A High Standard of Living?

The materials that contribute to our standard of living are divisible into two main categories: utility and ostentatious. In a critical study of any standard of living, the utility factors are the more significant. The ostentation is superfluous fluff.

THE AMERICAN press is currently busy informing us that the people of the United States have the highest standard of living in the world and that the people of West Germany have the highest standard in Europe. The impression that you are supposed to get from this ballyhoo is that everybody in these two countries is h a p p y and prosperous, and that it is a just reward for those who live in a f r e e enterprise, christian, democracy.

This claim has all the features of a propaganda hoax, including an element of fact. But the largest share of it is fictional.

It may be that the upper ten per cent of the families in the United States have a fairly large income, that they are in the upper income tax b r a c k e t s, and that they are able to create more than their proportionate share of debt in the conspicuous consumption of ostentatious merchandise. It may also be that the upper ten per cent in West Germany are in a similar position, but at a somewhat lower level.

The falsity begins where examples of this ten per cent are taken as illustrative of the whole population. It is on the life patterns of the more prosperous minority of the population that our publicity ballyhoo is based. Hollywood m o v i e s, for example, specialize in depicting this minority . . . A few teen-age American y o u t h s may be a b l e to race around in Cadillac convertibles; they are the rare exceptions. The great majority of teen-agers are lucky if they can command any kind of a p o s t w a r automobile; most of them have to be content with knowing someone who has a car. The majority of teen-agers in West Germany probably would feel fortunate if they owned bicycles.

The commercial and political p r o g a g a n d a is such that the people are indoctrinated in pres-

tige values more than in utility values. The question in America is not how good is the car as a transportation vehicle, but what is the make, model, year, rated horsepower, and decor. So thorough has this indoctrination been that teen-age girls tend to rate their boyfriends on the basis of the cars they drive. A cad in a Cadillac is a Prince Charming compared to an honest John in a '46 Ford.

The same standards of appreciation carry over into the adult population in one direction and into the juveniles in the other direction. Only toddlers of pre-kindergarten age are likely to look for what they regard as intrinsic values in an object, often much to the distress of their adoring parents. However, this period of innocence does not last long. . . In viewing a house, the family is less concerned with its qualifications as a machine for living than with its style, newness, address, and prestige appurtenances.

A family which is paying mortgage and interest on a new $35,000 ranch house in a swank suburb is considered to have five times the standard of living, in this respect, as that of a family living in a $7,000 house in an older development, although the latter may be entirely debt free and equally serviceable. In order to further promote this standard-of-living fiction, certain financial publications are advocating the building and selling of $50,000 homes on fifty-year mortgages on the theory that a homeowner might as well be paying on a house throughout his entire lifetime. And if he doesn't make it, the second generation can finish paying for it—just before replacing it with another new house.

Among the most conspicuous items are furs, jewelry, and objects of art, which have little if any utility value, but which may run the 'standard of living' into six figures for a few families and into lesser figures for many others. When only an expert can distinguish between a $10,000 diamond ring and a $20 'paste' job, the significance of prestige values in measuring one's standard of living becomes highly dubious.

A few families at the top of the economic pyramid are likely to be found living well in any society. Even in India, Arabia, and

Egypt, where poverty is a plague, there are some wealthy individuals and families living in luxury and splendor. Although the wealthy minority are the ones most often exhibited in slick magazine writeups and Hollywood movies, it is the group that interests us least when investigating the standard of living in an area.

How does the **lowest 20 per cent** live? That is the real key to the economic prosperity and administrative wisdom of an area. What kind of dwellings do the people of this group live in? What kind of transportation do they have? What kind of table do they set? What kind of health care do they get? What are their opportunities for **education, recreation,** social and cultural relations?

We shall not entertain here the moralistic argument that the upper ten per cent are **deserving** while the lower twenty per cent are **undeserving.** That is merely a philosophical evasion of the problem, as well as an excuse for avoiding responsibility for the situation. Nor do we subscribe to the thesis that poverty provides one with a superb opportunity for 'developing character.' In this context, 'character' means a docile acceptance of drudgery and want while doing nothing to interfere with the acquisition and enjoyment of riches by the 'upper class.' Even Divinity is presented as decreeing that the poor shall always be among us. It is easy to see on which side of the street the dominant philosophers of the ages have worked.

In any society wherein there is both wealth and poverty, one must presume that the wealthy minority is living well at the expense of the majority; that these wealthy individuals are living as virtual parasites on the society. Those of wealth may have every legal, moral, and traditional right to their economic status; but that does not alter the presumption that they are parasites. Even the claim that their acquisition and maintenance of the wealthy status contributes directly or indirectly to the general economic standard of the community, and is therefore benevolent, does not invalidate this presumption. If it were not for their extracting more than a proportionate share of the wealth of the community, they would not be able to live so well; thus, the wealth of the commu-

nity goes to support a few in elegance rather than being plowed back into the general welfare of the community.

We wish to make it clear at this point that we do not condemn the upper minority for living well. It is an enviable status. It is our position that, in a highly developed technological society, everyone should have the opportunity to live at a very high standard. What we do condemn is the bourgeois attitude that so frequently goes with wealth -- the attitude that the wealthy are deserving, that they are a better class of people, that the poor should remain poor. The bourgeois attitude malevolently resents any social change that would tend to raise the general standard of living up to the level of the bourgeoisie; and it hold stubbornly and tenaciously to the values and the patterns of the status quo. It violently resents any social regulations that hamper an intensification of the economic differentials in the society. For example, General Douglas MacArthur recently cast anathema upon high income taxes for the wealthy. President Eisenhower resolutely opposes salary raises for postal workers, but he is all in favor of high salaries and perquisites for high government officials. The American bourgeoisie objected stentoriously to the proposed imposition of a $25,000 limit on individual incomes (after taxes) during the war.

The materials that contribute to our standard of living are divisible into two main categories: utility and ostentatious. In a critical study of any standard of living, it is the utility factors which are the more significant. The ostentation is superfluous fluff, an egotistical exhibitionism, intended merely to impress other people with one's own importance. In utility terms, it is essentially waste. Most ostentation would rot away if cheap menial labor were not available for employment in its upkeep. The bourgeoisie has always capitalized on poverty; and now, in America, it resents the scarcity of available 'help' at 'reasonable' wages.

Much of America's overt standard of living is supported by debt, a mortgage on future income. It is not something for which title and use is full and clear. Much of the remainder is also cloudy as to title, since it is

supported by debt one or more times removed; for instance, federal debt. Theoretically at least, Americans must forfeit several hundred billion dollars worth of future standard of living to pay for that which they have already lived up. To that extent, their ballyhooed standard of living is built on loose sand.

However, it is stupid to suppose that the indebtedness of American people will stand in the way of their having a high standard of living in the future. The technology of the Continent can continue to produce a near abundance of everything. The debt may be an embarrassment so long as we choose to regard it as a sacred obligation. But at the showdown, technology will continue to produce and the debt will be abrogated.

Much has been written about the 'high standard' of living of ancient Rome. But, as in America today, history deals with only a small minority of the population, who lived as parasites on the great majority. The latter were sunken in poverty, filth, toil, superstition, and suppression. A large percentage of the population was composed of slaves who, on the whole, fared no better than the domestic beasts of burden. Slaves were cheap, being brought in by the thousands from military conquests, in addition to those acquired locally. Much of the wealth of the top minority came from the looting of neighboring areas, which accompanied the slaughtering of the resident populations. The big majority of ancient Rome, even at its height of 'glory,' lived miserably and died young.

The same, or worse, has been true of all areas of human society until very recent times, meaning the last century or so in the most advanced places and only a decade or two in some of the newer civilizations. And there are many countries which have not come out of that state yet; among them, the Mohammedan countries, most of Latin America, southeast Asia, and Africa.

But all civilization is on the move toward a higher standard of living; and, therein, lies the world's greatest dilemma.

The concept of the common man's being entitled to personal welfare and dignity is a very recent concept; and nowhere is this concept fully accepted and ap-

plied. It reaches its highest expression in those places where technology is most advanced; such as, North America, Australia and New Zealand, parts of Western Europe, the Soviet Union, and Japan. But in none of these places is it thoroughly adopted even in theory, much less in practice. The rural areas of West Europe, as well as the city slums, are a 'mess;' the centers of culture and enlightenment are only for the small minority with money and 'family' — and for tourists with money.

If one were to judge the social standard of a country by the living conditions of the lowest 20 per cent, no country would have anything to be proud of. It is when one investigates this lowest 20 per cent that one learns of the inefficiency, the corruption, and the technological backwardness of an area.

As we have indicated above, a high standard of living and an advanced technology go together. Human toil, no matter how cheap it may be, cannot compete economically with automatic machinery in the fields of production and service. But automatic machinery produces so abundantly that the old concept of distribution of goods and services through the medium of wages received for man-hours of work must be abandoned. If the people are to consume the production of the Machine Age, they must have unearned consuming privileges.

That is the dilemma which faces every Price System nation with an advanced technology, including the Soviet Union. It is most apparent in the United States and Canada. The traditional social values, upheld by political, business, and religious philosophy for thousands of years, must go down the drain. With them must go the classical concepts of class distinctions. It is this phase of the change that hurts the people most, psychologically; and it particularly hurts those with investments in the values of the status quo.

This psychological obstruction to advancement into an era of high living standards for the whole population is stubborn and vicious, but it is not insurmountable. In the long run, it could be eroded away by technology, given any reasonable degree of social tranquility. Or, due to contradictions within a Price System posed

on the brink of Abundance, it could be overcome by a mass-movement of the people, frustrated with the impasses in the flow-lines of the economic system coupled with loss of faith in the capabilities of their political administrators. The latter is the more likely of the two possibilities; but, if the mass movement is to avoid panicky confusion and chaos, it will have to have a positive goal and be strategically directed.

That phase of social change—a positive acceptance of it by the people—is not the most serious aspect of the problem. If people are to enjoy a high standard of living, they will demand more than merely food, bunk, and raiment. They will want more of the grander things of life—swank dwellings, elegant furniture and bric-a-brac, prestige transportation vehicles, stylish clothing, multiple course menus, and fashionable recreation. That is what the people are conditioned to want; and to supply it will require an order of statesmanship which has not yet been demonstrated in the world.

Fundamentally, it is a problem of acquiring energy and materials, the most critical of which are metals. Already the fossil fuels, from which most of mankind's energy is derived at this time, are in grave danger of early depletion; and the richer metal deposits of the earth are approaching exhaustion. Atomic energy, if it can be controlled (and it will be) gives man's energy supply an extension into the future, but a finite extension. Eventually, the problem of utilizing solar energy on a large scale probably will be overcome. So with respect to the essential energy requirements of the human race on the earth, there is a probability (though not yet a certainty) that the demand can be met for at least a few thousand years — but not under Price System practices. Further, we must assume that the population growth will not be allowed to run rampant much longer; for, if it does, all bets are off.

The problem of supplying the materials is far more serious than the problem of finding sources of energy. The supply of certain important elements is severely limited; and the supply of some of the more abundant elements, in concentrations suitable for easy recovery, is spotty. Some scien-

tists already are speaking of mining the rocks of the earth's crust down to a depth of two miles for their mineral content if the demands of human civilization are to be met for the next half million years (not a long period when we consider that man and his mammalian ancestors have been on earth for something like a hundred million years).

One thing is certain, if a high standard of living is to persist indefinitely, it will not be the pattern of living to which we aspire today. Today's preferred standard of living is far too wasteful for the human race to maintain for even a few more decades. Our present society is too rotten with the virus of commercialism. Even under conditions of severe scarcity, commercialism has always been a malignant, albeit not fatal, infection; but, under conditions of near abundance, it becomes fatally malignant. Commercialism, as a device for exploiting the world's resources and distributing the produce of a highly developed technology, must be eradicated from the earth if man's civilization is to thrive. We need only look at some of the commercial ballyhoo brochures advertising the World of Tomorrow to realize how ridiculously wasteful are the dreams of the enterprise boys.

The present limitations on the world's supply of energy and minerals does not necessarily preclude a high standard of living for the indefinite future; but the situation does demand an entirely new approach to the problem. One phase of this approach must be the extermination of the Price System. Another phase involves a far more efficient use of the energy and materials which are available. A third phase is a high priority program of scientific and technological research.

The statesmen of tomorrow must show at least as much interest in the technical aspects of society as do those of today in sports and speculative philosophy.

Considering the impossibility of achieving a sustained economy of abundance under the Price System, it is the height of futility for anyone to aspire to economic glory under this system. Even if it is achieved by the occasional individual, it is a dead-end proposition; there is no way of going forward with it. Individual prosperity under the Price System is

in conflict with the general welfare of the whole society. Hence, no matter how gratifying it may be to the individual, while it lasts, bourgeois prosperity is not something that can be adopted by society at large.

The definition for a high standard of living will have to undergo some changes as it applies to the future.

First of all, it must be applicable to the whole population, not just to a chosen few. The same standard of food, housing, clothing, transportation, recreation, and other factors must be available to all—as a matter of social simplicity and expediency, not necessarily as a matter of moral justice. Since there would then be no cheap labor available, production and services will have to be mechanized to the utmost; for, no man will want to be a servant, not even his own servant.

Energy will have to be degraded with the maximum of efficiency in terms of work output. The standard of living is closely associated with the amount of energy used, but the efficiency with which it is used is as important as the quantity available. Let us remember this formula: S equals Ee over PT, with **S** being the standard of living, **E** the quantity of energy consumed, **e** the percentage of efficiency in terms of work output equivalent, **P** the population, and **T** the time period. A high percentage of efficiency would not be so important if there were an unlimited supply of energy available; but that is not a practicable probability at this time, hence the stress on efficiency.

Minerals will have to be consumed with a minimum of wastage and a maximum of recovery after use. We cannot afford, among other things, to discard some 35 billion metal containers on the dumps of the United States each year for very long.

A high standard of living for every inhabitant of the Technate of America does not require that the artistic factors in design and mode of living be eliminated and that only drab utility factors be permitted. Art has its place. However, if it is not controlled, art tends to become malignant in its proliferations; as, for example, in the case of 'gingerbread' architecture. The prior emphasis must always be on function, with art subordinated to function. Where-

ever art does not interfere with function, or run up the social costs too much, it is not out of harmony with the age of abundance.

The future must, very soon, resolve the basic conflicts of the present time. And, let it be noted, the b a s i c conflict is not that between socialism a n d private enterprise, nor between 'slavery' and 'f r e e d o m.' It is a conflict between scarcity and abundance; human toil and automatic technology; between waste and efficiency—between the Price System and Technocracy.

In the quest for abundance and a high standard of living, science and technology must provide the direction and the goals. The highest social recognition and authority must be accorded the top men in this field. Artists, entertainers, and philosophers shall be mere puppets in comparison. For, with the coming of science, mankind placed its future, however unwittingly it may have done so, in the hands of the technical men. The real achievements of the past 400 years have all been in the technical field; and, for the future as well as for the recent past and present, only the technical men are able to 'deliver the goods.'

In the broad social field, Technocracy is the d e s i g n of the future, since it is the only social idea which is in complete accord with science and technology; and it is the only program for Abundance on the Continent of North America (or anywhere else in the world for that matter).

With science and Technocracy on the job, the matter of a high standard of living for all will cease to be a question and become a reality. **—Wilton Ivie, CHQ**

★ LOS ANGELES—A Southern California Edison company official said that about half of all new generating stations in the United States will be powered by nuclear fuel within 25 years.

W. L. Chadwick, vice-president of the utility, added that there is no indication that conventional power plants will become 'prematurely obsolete.'

Chadwick said that a piece of uranium a little larger than a golf ball can generate as much electrical energy as two and a half million gallons of fuel oil.

—International News Service

★ TOKYO—Idle freight cars, unfinished road work, mills that are slowing down, and increasing unemployment are the visible signs of a recession now hitting Japan.

—Reuters

The Fantasy of Limited War

It takes two to play at limited war, and there is always the risk that it might turn into unlimited thermonuclear war. Our experience in the Korean War tells us how reluctant either party is to leave the game when he holds the winning hand.

THE TEN-YEAR boom in armament has not only enriched our aircraft and missile merchants; it has provided employment for a whole regiment of university scholars who lecture and write on military policy. The well-nigh insoluble problems of nuclear military 'science' certainly offer a wide scope for the imagination. In the climate of the cold war, however, our new crop of military philosophers may bring forth any doctrines they wish about nuclear war, provided they favor it. They may think whatever they like about our national defense policy, provided they are 'right-thinking.' As long as they observe these principles, the scholars' discourses on war are eagerly sponsored by leaders in public life, makers of opinion, universities and even eleemosynary foundations. The following remarks are stimulated by three such recent utterances.

Power-Think is the real preoccupation of these military doctrinaires. Owing to the menace of Communist aggression in many forms and in many places, our foreign policy, in their view, must remain 'polarized'; must be conducted mainly by threats and counter-threats of military action, or by subsidy payments to potential allies. 'How can the United States utilize its military power as a rational . . . instrument of national policy?' is the paramount question that Professor R. E. Osgood undertakes to answer.[1] Dr. Henry Kissinger's coldly rational argument for a strategy of limited wars permits no concern for social morality or human values.[2] We are given only the

[1] LIMITED WAR. *The Challenge to American Strategy. By Robert E. Osgood. University of Chicago Press.*

[2] NUCLEAR WEAPONS AND FOREIGN POLICY. *By Henry A. Kissinger. Harper and Brothers.*

Reprinted from THE NATION.

simple alternative of yielding to 'g r a d u a l enslavement' by the Russians, or using o u r nuclear arms to preserve ourselves and our progeny in freedom.

Others have gone on to revise American traditions in conformity with the demands of nuclear power politics. According to Mr. Thomas E. Murray,[3] 'History has now laid on America, for fulfillment in the world at large . . . a n e w international mandate' for the defense of all mankind. Authority for such world-wide extension of our government's policing activities, Mr. M u r r a y believes, is somehow derived from the popular mandate given the founding fathers in 1788 w h e n they decreed the union of the 13 states. Now it happens that our Communist adversaries also claim a mandate from history. Hence, Mr. Murray concludes, the heart of our problem is 'how to harness the illimitable e n e r g i e s of the atom' in order to enforce our own mandate, thwart the mandate of the Communists and defend civilization.

[3] *Report to the Joint Congressional Committee on Atomic Energy: Thomas E. Murray (as published by the New York Times, July* 15, 1957).

How often in the past have sovereign powers, possessed of a large military equipment and desirous of using it, proclaimed that God or history was on their side! Napoleon's b i g armies received their sanction from the Goddess of Reason; Kaiser Wilhelm's were fired by the m i s s i o n of saving **Kultur,** that is to say, civilization.

That the business of 'guarding world democracy' w i t h nuclear arms is no simple matter is shown by the several drastic changes of policy announced during the last ten years by the Pentagon or the White H o u s e. After 1945, we looked with much complacency upon our so-called monopoly of the atom bomb 'secret' as yielding us a supreme advantage in war. Two years later, when the cold war began in earnest, America's military planners thought mainly in terms of air-atomic bombardment. They built up the Strategic Air C o m m a n d, with its long-ranged carriers of A - bombs as our chief military arm. Popular military journalists, such as Seversky, then advocated total air war and 'victory t h r o u g h air power.' Under Truman, the Secretaries of the Air Force, Syming-

(*Continued on Page* 33)

OBSERVATION - STUDY - ANALYSIS - REPORT.

RESEARCH BULLETIN

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Chemical Analysis by Pushbutton

IN TODAY'S RESEARCH LAB, if you want to know what chemicals are in a sample mixture perhaps a test tube is the last thing you would reach for. Instead, you would insert your sample in a machine, push a button, and sit back and wait—perhaps only a few minutes—for they answer in terms of both ingredients and quantities.

This type of analysis, practically unheard of before World War II, is becoming more common every day. In large labs, test tubes are being pushed aside in favor of the emission spectrometer, nuclear resonance analyser, differential refractometer, infrared spectograph, vapor fractometer, and mass spectrometer.

Fast Growth—In the space of a decade, sales of this type of instrument have jumped more than tenfold—to about $125-million a year. With them, they have brought some new names into the scientific limelight — Consolidated Electrodynamics Corp., Beckman Instruments, Inc., Perkin-Elmer Corp., Baird Atomic, and a half dozen others.

This shift to speedy, highly accurate analytical instruments is

only the first phase of the revolution. Already, the makers are beginning to adapt their instruments for use on the production line. This will provide fast and continuous checks of the product stream itself and that means corrections in the process could be made immediately. cutting waste and providing greater uniform quality.

The Possibilities—Eventually, say control and instrument men, the on-line instruments will be teamed up with computers to run entire plants. Some control men foresee the possibility of bettering chemical process efficiency as much as 20%. And almost everyone in the industry predicts that closer control over unstable reactions for which present analytical methods are not fast enough could mean new chemicals, new products, and important changes in the production economics. They see the new on-process monitoring instruments as the prelude to fully automatic plants.

Of course, even in chemicals, the automatic plant is still years off. Many obstacles stand in the way of on-process monitoring. But if the speed with which analytical instruments have made their way into the testing and quality control lab is any guide, then such developments are not too far off.

More Practical Instruments—A more important way of speeding up chemical analyses right now may be to put less expensive, smaller, and less complicated laboratory instruments into process control labs. The infra-red spectrometer, which identifies the compounds in gases by their characteristic absorption of long light waves, for example, has steadily shrunk in size and cost. The mass spectrometer bowed as a big $100,000 instrument, now comes in a desk-top $5,000 model. Others are following the trend.

If you walk into a testing lab today you will not find hordes of white-coated technicians sweating over a maze of glass tubing to separate out components chemically, then weigh them and write down the results. Sensitive machines do the work automatically in a fraction of the time. Most of them measure the physical properties of the sample, and by comparing them to known standards, make a highly accurate analysis.

Many Types—The instruments differ from one another according to the kind of sampling done. The synthetic rubber industry, for instance, depends on the mass spectrometer, an instrument developed by Consolidated Electrodynamics. By sorting the molecules of a mixture according to mass, the mass spectrometer can perform a complex organic quantitative analysis in a few minutes.

A testing lab serving an alloy shop of a big metals plant may be built around a couple of big cabinets containing an emission spectrometer, developed by Dow Chemical and built by Baird Atomic. A lab assistant loads the machine with a bit of metal delivered still warm by pneumatic tube from the metal shop. The machine buzzes for 30 seconds and dials spin. The lab man jots down the reading and hurries back to the plant. Elapsed time? About three minutes. And the lab report contains a complete quantitative analysis of the alloy—up to 18 elements—accurate to within one part in 10,000.

Case History—How fast such instruments are winning acceptance is seen in the history of the vapor fractometer, a relatively new analytical instrument built by about a dozen manufacturers, including Perkin-Elmer Corp., Norwalk, Conn. This machine is a whiz at separating and totting up the proportions of hydrocarbon chemical mixtures. A few years ago, analyzing a mixture of butadiene, propane, butane, and propylene would have been a terrible headache to a chemist. Now, thanks to the vapor fractometer, it's a five-minute job.

Essentially, a vapor fractometer is a piece of tubing a couple of yards long filled with an absorbent material, such as brick dust. A sample of mixed gases, pushed through by an insert carrier such as helium, comes out of the other end of the tube one component at a time. The differential absorption of components by the common material causes some parts of the sample to pass through more quickly than others.

Mechanisms to control sample volume, temperature, and carrier flow rate, plus a simple but sensitive detection device at the outflow end of the tube complete the instrument. It's not too hard to manufacture, and it is extremely simple to operate. Lab men say it does a first-class job.

Instant Success—The success of the vapor fractometer took the instrument manufacturers completely by surprise. Perkin - Elmer, which claims to sell the majority of such instruments, brought out its first commercial model in 1955. P-E estimated that about 200 instruments would saturate the market. Their version, a desk-top instrument, was priced in the $2,000 range, which is low considering its versatility and analytic power.

Word of the new instrument spread fast. Within a few months, P-E was swamped with orders. Large laboratories bought them by the half dozen, and chemical processing companies by the dozen. Today, there are more than 1,500 in use. Before long, it may be a standard process monitoring instrument as well.

Development Pattern—The development of the vapor fractometer follows a fairly typical pattern. Most analytical instruments are dreamed up either in academic laboratories or by the instrumentation staffs in process industries. The vapor fractometer actually originated in England. Perkin-Elmer and several other American companies designed their own low-cost versions and put them on the market simultaneously. But most instrument manufacturers are small businesses; they can't afford to gamble a big research budget on developing new instruments.

Sometimes the instrument company works right along with the chemical process. Watts Mfg. Co., a small concern in Roceverte, W. Va., developed an industrial version of the vapor fractometer under the guidance of Union Carbide & Carbon Corp.'s instrumentation engineers. Beckman Instruments, Inc., acquired Watts and brought out the first commercial on-process vapor fractometer at the beginning of this year.

Joint Project—Perkin-Elmer will unveil its industrial version of the instrument at the Instrument Show in Cleveland. Instead of going to one company for help in developing a marketable on-process machine, P-E contacted 10 major chemical companies, including Phillips Petroleum, Esso, Union Carbide, Dow Chemical Co., and American Cyanamid. For $5,000, each was offered an interim instrument for field testing purposes. All accepted. The instruments were

made and installed, and the chemical companies, particularly Phillips, fed back information to P-E on the machine's performance. As the information came in, P-E's development staff incorporated changes in the production version. This arrangement not only helped P-E to underwrite about 80% of the development cost, but also resulted in a more versatile machine, P-E feels.

The big difficulty in adapting analytical instruments for one process use is building them strong enough to withstand wear and tear. Their rather delicate electronic innards have to be protected with heavy steel casing. Compared to the husky pneumatic and hydraulic instruments and control now incorporated in production equipment, the analytic instruments are fragile.

A few rugged industrial versions of laboratory instruments already are on the market and more are on the way. In addition to the vapor fractometer, for example, the infrared analyser and the refractometer, which measures how much a gas or liquid bends a light beam, have been adapted for on-process monitoring.

Obstacles—There are a number of other hurdles blocking the way of a mass invasion of production plants by analytical instruments. Among them:

The chemical industry, though anxious to improve, is dragging its feet when it comes to installing on-process monitoring instruments extensively. Few companies are willing to gamble on adapting a million-dollar plant so its performance is geared to a $5,000 instrument on which they have no reliability records or performance data. And, unlike most other industries, the chemical process industry already is so mechanized that reduction in the labor force is no longer an incentive to change. A new process or control will win out only if it produces a better product at less cost.

Not enough is known about controlling massive chemical reactions—such as those that take place in a big catalytic cracker in a refinery—to make effective use of the fine data supplied by the most powerful analytic tools.

Chemical plant operating personnel and maintenance staffs are

not instrumentation engineers. They can't always cope with the most sensitive and complicated new analytical instruments.

Much mathematical theory and computation has to be completed on paper before an electronic analytic instrument can be designed and programmed to handle the hundreds and sometimes thousands of variables involved in changing the product stream in a single process.

Outlook—But there's no doubt that the instrument makers will surmount these hurdles eventually. For one thing, if the first process instruments now in use perform satisfactorily, they will do much to hasten the shift. The fine data they provide will help the production men to learn more about controlling chemical reactions. This in turn will give them the knowhow and the confidence to use on-process control monitoring more extensively. Once this begins to happen, the shift by the whole chemical industry to true automatic process analysis and control will only be a matter of time. **—Business Week**

Pulp and Paper Technology

THREE major revolutionary changes may well occur in the paper and pulp industry within the next ten years. They are: (1) The merging of mechanical pulping (grinding) with chemical pulping (chemical separation of the fibrous from nonfibrous constituents); (2) Conversion of chemical pulping from batch to continuous operation at very high speeds; (3) Addition of (liquid) processing as a major activity of the industry for production of by-product chemicals.

Chemi-Groundwood—During the past few years, it has been found that when wood is given a steam treatment to raise its temperature and then a mild impregnation with a chemical solution to soften and plasticize the constituents which hold the fibers together, without actually accomplishing what could properly be called chemical pulping, the wood can then be pulled apart into fiber bundles and constituent fibers very readily and quickly by mechanical processes.

This material is then reduced to paper-making pulp by further mechanical brushing out of the fiber bundles. One variant of this is the so-called 'chemi-groundwood' process, developed at Syracuse University and now in mill use at Great Northern Paper Co. at Millinocket, Maine. This unit employs very large batch digesters into which whole logs are fed. After steam treatment and chemical impregnation under pressure the wood is pulped mechanically by grinding.

Semichemical — Another variant is the 'semichemical process,' in use at the growing number of mills, in which wood chips are subjected to a relatively brief chemical treatment, generally at low concentrations of sodium-base alkali or acid, and are then pulled apart into pulp by machines known as 'refiners' which shear the wood parallel to the long dimensions of the fibers and brush out the fiber bundles and fibers to produce an acceptable pulp for paper-making.

High-Yield Chemical Pulp—A third variant of the partly chemical and partly mechanical processing can be seen at the Gould Paper Co. in Lyons Falls, N.Y. There, a control console regulates the feeding of wood chips and cold caustic solution into a Bauer rapid-cycle digester which operates on the basis of the repeated treatment of relatively small batches for short intervals of time, and then the feeding of the soaked chips into a refining operation which produces a pulp that can not only be substituted for some of the groundwood in newsprint and book papers but also can be a major pulp in other types of paper making by itself.

These developments tend to speed up processing, to make sequence of operations continuous and more automatically controlled, and to integrate the mechanical and chemical processes so completely that the terms 'semichemical,' 'chemi-groundwood' and 'high-yield chemical pulp' are losing their separate connotations.

Extension of these trends should lead to a telescoping of the steps now carried out sequentially into even faster processes, which might be called 'chemico-mechanical' or 'mechanico-chemical.'

Pressures for ever greater production to meet the seemingly

insatiable demand for pulp and paper products (which, it is predicted, will more than double by 1980) have already caused a shortening of the total time cycles of the batch operations from many hours to only a few hours. This has been accomplished by juggling the variables of temperature and pressure, liquid composition, packing of wood chips into the cooking vessels or digesters, and pretreatment of the wood to achieve faster and more complete penetration with the cooking solutions. It has been done through a good deal of purely empirical experimentation, guided and abetted by much laboratory research. But always attempts toward speeding up of existing types of operations have been limited by the design of the equipment —by the sizes and capacities of lines, valves, and steam plants, by the difficulties of getting uniformity and speed of liquor penetration or circulation or heat transfer in vats which hold upwards of 15 tons of raw material per batch, and by the sheer problem of handling so much material at any one instant.

Continuous Digesters—But there is now a well-established and accelerating trend towards the re-design of basic parts of the equipment to better accomplish higher through-put. One example of this is seen in the continuous digester. Dozens have been installed in various parts of the world since the end of World War II—as the only units in new mills, and as replacements and supplements in existing mills. They seem to have all the advantages which chemical engineers are accustomed to associate with continuous versus batch operations—reduced capital and operating costs, greater uniformity of performance and product, ease of automatic control, shorter cycles, and so on. For these reasons they could sweep the industry to replace existing batch units. That they do not is simply because such huge capital investments as are represented by the conventional batch-digester equipped plants cannot be written off suddenly without sharp dislocations in the industry's (or at least the individual company's) economy.

Used at first primarily for rather coarse grades of pulp, these continuous units and the processes related to them are now being adapted and adjusted to produce high-quality products. With wood

materials as the feed, most of these continuous units operate on cycles from two to three hours down to less than an hour. And with a feed of sugar cane waste or bagasse, and with a new chemical process, a mill in Peru is reported to have produced various grades of pulp in cycles ranging from ten minutes down to two minutes—which is really high speed compared with the long cycles of yesterday!

The extension of such continuous chemical-pulping operations would constitute a revolution involving an obvious growth of importance of the chemical engineer. Knowledge presently available in research laboratories when translated into commercial practice will entail even more revolutionary changes. For example, wafers of wood only 0.02 inches to 0.05 inches thick prepared in a now commercially available wafering machine, penetrated thoroughly in a few seconds by cooking liquors, can be reduced to high quality pulp in 30 seconds or less. This could not possibly be done in conventional batching equipment. It depends on very sudden and uniform rise of temperature to the reaction level to bring about rapid treatment, and to avoid inequalities of treatment or even localized damage through uneven cooking. It requires some completely non-conventional method of heating to 150° to 250°C., such as radio frequency, and for rapid mechanical handling through each phase from raw wood to pulp. This means very high speed continuous pulping. It will be accomplished by machines with high tonnage capacity and small enough to be portable or semiportable. They can be placed right in the woods, eliminating the moving of the wood to the mill, and rehandling in the mills. What an aid the small packaged atomic power plant would be in this case! Such high speed operations would make the chemical pulp mill resemble closely in design the modern petroleum refinery, with its high degree of automatic control.

—L. R. Thiesmeyer, President of the Pulp & Paper Institute of Canada

★ NEW YORK—The value of electronic computers sold or rented in the United States is expected to reach $350,000,000 this year, which would almost quadruple the $94,000,000 figure of 1956.

In 1955 the comparative figure was $47,000,000. —*Associated Press*

Through the Technoscope . . .

Technocracy examines the various social and technological trends in North America today which point to the necessity for a new social mechanism that will provide security and abundance, with a minimum of working hours, to every citizen on this Continent.

A NEW CRUSHING MACHINE, ONE of the largest off-the-road units ever built, can cut down dense forests and jungles at the rate of an acre every 15 minutes, leaving behind 20-foot paths of matted pulp and splinters where trees once stood.

The 280,000-pound machine, called the Electric Tree Crusher, is constructed by R. G. LeTourneau. It just rolls over ordinary-size trees. But when it comes up against really big ones, it moves up the side of them until enough of its 75-foot length can work as a lever to topple them. More than 300 ax-like teeth on each of the 49-foot rollers grind the trunks to pulp, which either are plowed under or removed by trucks.

The machine's devastation is controlled by a driver who sits in a cab high up on the 25-foot tall unit. He feeds power from the generator driven by a 600-hp. diesel engine with a 1000-gallon fuel tank and steers with push-buttons.

BY MECHANIZING THE SPREADing of a cotter-pin, the assembly of domestic washing machines is being expedited at the Clyde (Ohio) Division of Whirlpool-Seeger Corporation. Specifically, gears are attached to one end of agitator shafts by means of an air-operated device.

AN ELECTRONIC BRAIN DOES IN two to 10 minutes the work of solving problems which formerly took engineers two to four hours at the Fellows Gear Shaper Co., Springfield, Vermont. The machine, a Bendix G-15 computer, is currently applied to problems involved in the design and detail of tools used on the company's line of gear shapers and gear shavers.

A PRESSURE IMPULSE COUNTER for pneumatic and hydraulic systems, which will automatically count pressure fluctuations between given limits, has been developed by Dunlop Rubber Co. Ltd., London. Its main purpose is to determine fatigue life in pressure where the critical factor is the number of changes in pressure during the vessel's lifetime. Maximum working pressure the unit is designed for is 2500 psi.

AN ELECTROMAGNETIC MINERAL separator that replaces rectifying tubes with transistors that don't have to be warmed up is being manufactured by Carpco Manufacturing, Jacksonville, Fla. The separator, model M-12, has a specially designed potentiometer and circuit that allows continuous variable control of magnetic flux from zero to full saturation of magnetic components.

THE GROWING FAMILY OF COMputers for industrial use has a new addition. It is a digital computer specially designed to control automatically such complex industrial processes and tests as oil refining, wind tunnel velocities, engine test stands and speeds. The desk-size machine was fathered by Ramo-Wooldridge Corp., Los Angeles.

The instrument, called RW-300, uses transistors in place of tubes and a medium-speed magnetic drum that can store up to 7936 words of arithmetic and control instructions and feed the information out at the rate of a word every 8.3 milliseconds. While this is slow by high-speed computer standards, it is sufficient for production control and makes it easier to keep the machine in good operating order.

A TRANSISTORIZED RADIOLOGIcal survey meter, to measure and record radioactivity in research and metal labors using radioactive materials, is now being marketed by Universal Transistor Products Corp., Westbury, N.Y. The 3½-pound unit, warning personnel of too much alpha and beta radiation, will operate for 150 hours on two flashlight batteries.

A NEW SYNTHETIC RUBBER, called Genthane S, that can be processed on standard rubber machinery has been developed by General Tire & Rubber Co. The firm says that its new synthetic is capable of outwearing any known rubber. It is completely resistant to oil and ozone and can be stored indefinitely without deteriorating.

THE BIGGEST-EVER OVERHEAD ladle crane is being installed at the Sparrows Point plant of Bethlehem Steel. The $1,500,000 crane is one of three being built for the plant by Morgan Engineering Co., of Alliance, Ohio. It handles 375 tons of molten steel in a single pour—thus doing in one trip the work of three smaller cranes.

MICROFILM ENLARGEMENTS CAN be printed automatically in less than 10 seconds with a reader-printer developed by Minnesota Mining and Manufacturing Co., St. Paul. The machine is expected to do away with the difficulty of using microfilm for current files.

METRIC MEASUREMENTS HAVE won another convert in the pharmaceutical and fine chemical industry. The S.E. Massengill Co. has made the switch away from the complex Anglo-American system of pounds, ounces and what have you at its Bristol (Tenn.) plant.

USE OF INCREDIBLY TINY 'CRYOtrons' in place of tubes and transistors in computer research by the Massachusetts Institute of Technology has been announced as a major contribution to a 'revolution' in electronics. A hundred cryotrons can fit into a thimble.

Cryotrons are little coils of hair-thin wire wrapped around a piece of straight wire. The metal in the straight wire, when held under low refrigeration, allows an electric current to flow through it without any resistance. But the little coil produces a magnetic field which can control that flow—shutting the current off or turning it on.

DEVELOPMENT OF A NEW 'MA-chine gun' assembly technique has been announced by Hughes Aircraft Co., Culver City, Calif. The new manufacturing shortcut substitutes mass-production methods for long, laborious handwork in incorporating tiny semiconductors, which replace large vacuum tubes, into electronic circuits.

The technique uses long flexible belts of precisely spaced semiconductors that feed into stapling machines. The machines tack the tiny electronic components into place. Formerly, workers had to handle each semiconductor separately, thus limiting output.

AN ELECTRONIC BEARING TESTer, manufactured by Sherry Products Inc., Danbury, Conn., consists of a metal probe connected to an electronic amplifier equipped with a calibrated meter, loudspeaker and controls. The probe picks up machine troubles and transmits them as an electrical impulse to the amplifier. The amplifier turns the impulses to noise, which can be metered by the operator for a more accurate check.

THE LIQUID LEVEL IN ANY ONE of as many as 100 storage tanks can be read at the flick of a dial by a single operator using a new remote level indicator developed by Texas Instrument Inc. The compact system, utilizing a transistor circuit, reads depths up to 64 feet with an accuracy of 1/16 inch. From a central console, the operator of a tank farm can dial any tank, get the amount of liquid in it telemetered to him in the form of lighted numerals.

★ BONN—Echo sounding, normally used to measure the depth of the sea, can be adapted for measuring the thickness of bacon on living pigs, the West German Pig Breeders Association has reported.

Three experts who tried the system on 137 pigs said it is accurate enough for breeding and economic purposes, simple to carry out and painless for the pigs.

Echo sounding works by means of supersonic impulses which penetrate the bacon and bounce back from the bones. An instrument measures the time it takes an impulse to return from its starting point. The longer it takes, the thicker the bacon. —*Reuters*

★ LONDON—The Moscow electro-medical apparatus works has produced the first batch of sleep-inducing machines, Moscow Radio has reported.

The machine can if necessary replare ordinary sleeping pills and also narcotics used for operations, Moscow Radio claimed, saying high-frequency current produced with this machine and applied to a patient's nervous system induces long and deep sleep. —*Reuters*

★ HOT SPRINGS, Va.—Softening of the business boom and a letup of inflation in the United States was foreseen by heads of more than 100 of the largest U.S. corporations meeting here with Commerce Secretary Weeks.

Members of the Commerce Department's business advisory council, they agree generally that business is levelling off. —*Associated Press*

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ton and, later, Finletter, outlined plans for massive deterrence or massive retaliation. In September, 1949, however, the Russians exploded their first atom bomb.

We then turned to making 'super' or H-bombs, holding that our forward airbases and long-range planes still gave us a decisive advantage. Yet in the Korean War we found that the weapons of mass extermination were inappropriate. As it happened, neither that war nor the Indo-China crisis of 1954 was arranged to suit our special military capabilities for large area devastation. In any case, the Russians had by then perfected an H-bomb of their own. The civil war in Indo-China, like the Korean War, required 'conventional' forces and arms, which America had neglected in favor of air-atomic power. Both wars were kept confined by both sides, and both ended in a peace of compromise.

At the height of the Indo-Chinese crisis, Secretary Dulles and Admiral Radford favored dropping A-bombs over the battle zone as an experiment in limited nuclear war; but they were overruled by the British and by President Eisenhower. The Russians, who had previously focused their resources on building a defensive air force, had developed by the end of 1954 long-range (inter-continental) jet bombers capable of reaching U.S. territory. Thus Russia and the United States reached approximate air-atomic parity, or the phase of stalemate. Once more our military policy underwent a shift.

For three years we have existed in what has been called a 'balance of terror,' with the two military superstates each having the power to inflict inordinate destruction upon the other while lacking any adequate defense of the homeland. Talk of massive retaliation no longer makes any sense. Obviously the Pentagon has found itself in a quandary. One can foresee a saturation point being reached in 'super - bombs' for strategic use. Moreover, the taxpayers may grow tired of supporting a huge military budget devoted to making arms of such power that we dare not use them. (The Russians, meanwhile are suspected of a strategy favoring local disturbances where atomic therapy might work badly.)

Hence the military authorities

have begun to talk up schemes for employing small or low-yield nuclear weapons—President Eisenhower's 'clean' bombs—in localized conflicts. The well-informed Mr. Murray assures us that we need not fear the effects of radiation generated by the newly-developed nuclear missles. They may be 'safely' used, it is held, as means of 'graduated deterrence' so that the punishment in each case will fit the crime. Now come Messrs. Kissinger and Osgood to gather up all the current ideas about running off limited wars and present them, with an air of scholarly authority, in book form.

Is it to be, then, limited war? This is improvement, indeed! Up to now we had only a stunning picture of a total war that would destroy civilized life in Eurasia, while leaving us with (an estimated) 68 million dead or maimed. Now that there are to be only 'small' wars, with but three or four million sacrificed here and there, we may breathe more easily. What is more, Dr. Kissinger assures us that — thanks to technological progress — these affairs will be managed at supersonic speed so that the victims will have no time to worry about what hit them.

Kissinger's ideas for limited war have been touted by Gordon Dean, Hamilton Fish Armstrong and others as constituting a highly original and even 'revolutionary' strategy, providing the means for both containing the Russians and avoiding the horrors of all-out nuclear war. This is as much as to say that he has invented the equivalent of that old farmer's shotgun which, according to Yankee folklore, would miss if aimed at a cow, but would hit the target if it was a deer!

Nuclear Weapons and Foreign Policy is, in truth, a sprightly and provocative affair. Its author takes the reader on a fast ride through the world of nuclear-military 'science' and geopolitics. His book is a manual on How to Win Limited Wars, or How to Out-Fox the Enemy Every Time. Disarmament conferences he considers futile, because the U.S. and Russia are so far apart that they cannot agree on minor issues, let alone shed some of their guns. On the other hand, total wars no longer pay; the dread of mutual retaliation as suicide pact tends to paralyze our defense policy.

We must not, however, become rigid with fear: if we employ flexible measures, using a 'broad spectrum of military-nuclear capabilities,' we may counter the cunning shifts or threats of the Communist powers. It is Kissinger's fervent hope that out of the present deadlock, so bleak to the professional military, a new strategy of limited warfare may be evolved, so that we can again afford to march off to war. The losses will be limited; the winnings also will be small. In such times as these, Americans must learn to restrain both their hopes and their moral principles and 'run risks without a guarantee of success.'

Professor Osgood's **Limited War** (which complements Kissinger's work of analysis) relies mainly on the historical method, examining specimens of brief military actions in times past. Indeed, both writers speak with nostalgia of the Louis XV style wars, directed by the Marechal de Saxe like formal court ballets. Following strict conventions mutually observed, there were elaborate maneuvers for position, patient sieges; generals took pride in avoiding battle, sparing cities and even keeping off the grass until the harvests were in. And there were brave costumes, flags and band music; at Fontenoy the aristocratic French officers sighted their cannons with gold lorgnons; the gallant British invited them to fire first. The heads of the warring states, meanwhile, being usually related to each other and having the same ideology, played for small gains, then called the game off.

Kissinger and Osgood would have us return to such wars, restricted in weapons as in theatre through **prior diplomatic agreements** between the contending powers. To be sure, they would insist on using all the newfangled machines that are expected to be ready for the 1960s: mobile armies of specialists with heavy striking-power, air-lifted by vertical take-off airplanes requiring no airports. The arms would include the new low-yield nuclear bombs, missiles or artillery shells, of four to 500 kilotons (TNT) capacity, for tactical operation against military personnel and installations exclusively. The battle zone would be 500 miles in depth, according to Kissinger's 'projection'; cities outside the zone would be immune to

attack; those within it would also be spared if they were declared 'open' after mutual inspection showed that they held no military installations. He goes on:

'We might propose that neither bases of the opposing strategic air forces . . . would be attacked. It would be helpful that inspectors be admitted to those bases.'

Moreover, each side would hold its terrible strategic weapons in reserve, for instantaneous use in the event that the other violated the rules of Dr. Kissinger's nuclear polo game. Should that occur, we would proceed, I suppose, to blow up everything, including ourselves, being comforted by the thought that Mr. Khrushchev would surely lose his job.

The kind of war Kissinger proposes, of phantom air-lifted armies racing around each other, has been criticized as being—like other extrapolations of future nuclear war—fanciful indeed. It is a truism among military analysts that the actual effect of a variety of new weapons or tactics can never be estimated properly until they have been tested under battle conditions.

In what theatre could such 'limited nuclear warfare' be staged? Would it not be best to consign it to Antarctica, rather than Europe with its dense population? The blast power of even low-yield bombs runs up to 20 times that dropped on Hiroshima. About a year ago the NATO forces held air-war games (they were but little publicized in America), simulating the defense of West Germany against an enemy invader. German military correspondents watched closely while some 335 simulated nuclear bombs were dropped within 48 hours over an area stretching from the Netherlands to the Austrian border. 'The first exposure to the real NATO strategy,' Kissinger admits, 'came as a severe shock to German opinion.' After estimating the simulated damages, our German allies had serious second thoughts about the usefulness of such a 'local defense' of West Germany. Is not 'limited nuclear war' — though Kissinger denies it—a contradiction in terms?

How are both sides to be held strictly to the rules? How, amid the dust of battle, are dreadful **misinterpretations** to be avoided? In answer to such questions Kis-

singer is, by turns, plausible or glib—indeed the suspicion grows upon us that, with tongue in cheek, he is really giving us a clever satire on modern power politics carried out **ad absurdum.** Since all-out nuclear war, he argues, means a suicide pact both for the United States and Russia, it is to the interest of both to work out rules for limited war; the Russians understand this as well as anyone. (But earlier in the book he has assured us that the Russians are fanatical 'barbarians' who can never agree with us on anything. Now, when it suits him, Kissinger pictures them as 'reasonable' creatures.)

In a tone almost like that of serious **blague** he goes on to recommend that we should always announce in advance our own objectives and intended measures of war, since it is all-important that the enemy should not misinterpret our intentions. (Osgood and other authorities, however, oppose such unambiguous interchanges of intelligence, as being likely to spoil the deterrent effect of any war threat.) Kissinger concludes:

'It therefore becomes **the task of our diplomacy** to convey to our opponent what we understand by limited nuclear war, or at least what limitations we are willing to observe. Unless some concept of limitation is established in advance, miscalculation . . . may cause the war to become all-out even should both sides intend to limit it.'

Yet if such elaborate exercises in diplomacy are to be staged in advance of a limited war, calling for exchanges of intelligence and guarantees, and even mutual inspection, then why in Heaven's name cannot the same diplomatic effort be extended toward bringing about peaceful compromises? Even Professor Osgood, who also loves limited war, holds that the Russians have reconciled themselves to numerous painful compromises, from that of Greece in 1947 to Suez in 1956. Both writers, meanwhile, oppose agreements for 'banning the bomb' and returning to conventional arms, those of 1939-45, as being favorable to the Communist powers with their larger manpower. But the program for limited nuclear war, Kissinger says flatly on page 196, is to our advantage and unfavorable to Russia. Now all the Russians need to do is turn to

page 196, and the Kremlin will reject the whole scheme. The only constructive suggestion in **Nuclear Weapons and Foreign Policy** is that of extended diplomatic **pourparlers** to precede the ritual of limited war. Let us hope that they become extended and **contagious.**

Nevertheless, Dr. Kissinger's proposals, according to reliable reports, are being seriously weighed by the Pentagon. One of the most interesting features of the limited nuclear war business is that it would demand more, not less, expenditure of money for new types of arms — ultimately about $65 billion a year. Besides, the thing might go on forever, as Kissinger admits, since the winnings would be small, or perhaps nothing. This is a point of great significance to our expansion-minded military bureaucrats and to the technical-war industries which contribute so much to our prosperity.

Napoleon said there was really no such thing as military strategy. There is probably no such thing as a strategy of limited war, no insurance that it will turn out to be brief and chivalrous. The German army's general staff in 1914 laid brilliant plans for a quick war, aimed at knocking out the French in six weeks (as in 1871). No one can say how these things can be managed conveniently. Osgood in his survey of various 'short and local contests' waged during the 19th century, and prior to 1914, ignores the fact that they usually served as dress rehearsals for the total wars that followed. Strangely enough, he passes over the recent examples of the Spanish Civil War (1936-1939) and of Japan's limited warfare in China in the 1930s. On the Balkan Wars (1912-1913) and the Russo-Japanese War (1904-1905) he concludes fallaciously that they 'caused little disruption of society.' The little Balkan Wars set off a chain reaction that led to Sarajevo in 1914. The Russo-Japanese War, which the Czar, no doubt, intended to be quick and profitable for his dynasty, led to a great popular insurrection in Russia and prepared the way for the triumph of the Bolsheviks a decade later. The only scientific estimate that can be made about the results to be anticipated from limited wars is that you simply cannot estimate them.

—Matthew Josephson

The Threat of Abundance

The ghost of abundance has not been laid. We stand in as much danger today as in the thirties of being forced into grinding poverty and privation in the midst of plenty. Even without the effects of a peacetime economy we are suffering from that virus now.

UNDER the heading 'Industry's New Worry — Too Much Capacity,' **U.S. News and World Report** in a recent issue calls attention to some interesting facts. On the basis of the latest statistics it sets down the growth during the last five years in the capacity of U.S. industry. To those who do not keep in touch with this kind of thing the figures will be revealing if not startling.

Without going into details the article — 'which represents the result of extensive research' — proves convincingly that industries have now more plant than they need to fill effective demand. Some plants are closed and many are working shorter hours. Industrial expansion has e n d e d shortages, says the writer, and created new headaches for business. The article concludes:

'Thus, the rush to expand slows down in some industries but not in others, e v e n though few of them are able to use all their new plants to the best advantage. There is a good deal of unused capacity. There are surpluses of many things. For the first time in years, the businessman, as well as the consumer, is able to get almost everything he wants to buy without encountering shortages.'

The m o s t striking feature of these findings, oddly enough, is not mentioned. T h a t is, surely, that this remarkable result has been achieved over a period when the manufacture of armament of all kinds has been making the heaviest demands on American productive capacity in peacetime history. Thus the U.S. plant is now geared to produce a surplus of consumer g o o d s and at the same time take in its stride the massive requirements needed to maintain up-to-date military preparedness at home not to mention the far from insignificant quan-

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tities supplied to allies abroad. It would seem in short that the U.S. has learned how to make guns and butter too.

But the thoughtful observer might be moved to inquire what will happen if the need for military preparedness should relax or cease altogether? As it happens in its most recent issue the same periodical touches on this phase of the question. The second article bears the significant heading: 'Will Arms Cuts Hurt Business? — There Will Be Fewer Jobs, Fewer Orders, With $2,600,000,000 Drop in Spending.' Very briefly here are the effects which it is calculated will flow from this comparatively modest arms cut: Aircraft industry will be hit hard first with cancellations that may cost up to 100,000 jobs. Hefty cuts in defence orders are planned too in other industries — petroleum, food, clothing, weapons, vehicles, electronics. Businesses in communities from Seattle to New York will feel the effects of closing or curtailing dozens of military installations. To add to the difficulty a cut of 100,000 is being made immediately in military manpower which will later be extended to possibly 300,000. Civilian personnel is to be reduced by about 10 per cent; military installations will be closed down or reduced and so on. The writer hopefully concludes:

'In all three services, manpower cuts will be substantial. Layoffs, less recruiting for military service and a cutback in hiring of civilian employees, all will increase the labor pool available to private employers.'

One wonders whether the writer of this second article read the first one. Had he done so he would hardly have offered the suggestion about more labor for private employers. For the first article set out to prove and did prove that private employers have in the aggregate more labor than they can use and are themselves even now cutting down.

What applies to the United States applies with equal force to Canada. The market for consumer goods is in many cases saturated here too. What will happen to us if the sanguine hopes of those who work for permanent peace and disarmament are realized; if those in uniform are returned to civilian life demanding jobs; if military production is sharply reduced and thousands thrown out

of work? To ask the question is enough; the answer is obvious.

All this shows plainly—as we have so often stated — that the ghost of abundance has not been laid. We stand in as much danger today as in the thirties of being forced into grinding poverty and privation in the midst of plenty. Indeed even without the devastating effects of the establishment of durable peace we are suffering from that virus now.

Everybody knows that this is madness, that abundance is what man works for and wants. Everyone knows too that there is no such thing as a real surplus in needed commodities or luxuries even in the wealthy United States. It is not a question of a surplus of goods but of a s h o r t a g e of money in the pockets of those who need and want those very goods. As B. R. Sen, head of FAO, put it at the IFAP conference:

'Clearly, to a large extent, the so-called surplus problem is but the reverse of inadequate purchasing power of millions of underfed and ill-clothed people who are too poor to buy the goods they would like to obtain.'

If that is true of the U.S. how much more is it true of other less fortunate peoples. The problem that must be faced and which was with us in the thirties but was not faced then is that of distribution—the problem of devising means of getting the goods and services we do or can produce to those consumers in need of them at home and abroad but who under t h e present dispensation have not the purchasing power to acquire them in what we have come to regard as the normal way. Is that a visionary proposal, the pipe dream of a feckless dreamer? It can be that only to the man without v i s i o n or wisdom, the 'practical' man who will get us into a worse one if something isn't done to check him or cast him aside.

★ MANILA—A machine to turn corn into artificial rice has arrived in Manila. Government officials hope its output will be acceptable when real rice—a staple of the native diet—is short.

The machine was invented by Robert I. Kauffman, a 37-year-old American. Government officials say it can be moved about easily on a trailer and can process enough corn to feed 25,000 persons a day at a cost of about five cents a person.

—Associated Press

A Whale in a Pail?

Simple Simon went a-fishing, for to catch a whale;
All the water he could find was in his mother's pail.
—Mother Goose

THIS nonsense rhyme is no more nonsensical than what is taking place politically, economically, and socially on this Continent today. Our government administrators are faced with whale-size demands, which they are trying to handle within the pail-size capacity of the Price System. The total population of Alaska, Canada, United States, and Mexico is approximately 216 million. All these people require food, clothing, shelter, transportation, and recreation: but the Price System is an extremely inadequate method of distributing goods and services. Moreover, facts and figures indicate plainly that continued use of this system will lead to a collapse of our entire economic structure.

It is nonsensical to continue with politics, business enterprise, and the Price System. The change from one party to another, or from one political leader to another within the same party, makes little difference in the overall picture. We still have to live within the cramped limitations of the Price System, under which millions of our people are ill-housed, ill-clothed, ill-fed, and are kept in a state of ignorance and superstition because of lack of adequate education. Political governance, being directed by opinion rather than by scientific knowledge, does not recognize the fact that there has been a definite change in the industrial status — that this Continent has outgrown pail-size operations and is now ready for whale-size operations, which cannot be carried on by politics nor by 'business as usual.' Even our 'top-notch' economists form their conclusions mainly from precedent and opinion rather than from scientific survey.

Business, becoming less and less able to function under present conditions, has to depend more and more upon government subsidies. Small businesses, which do not have the support of the

governments of Canada and the United States, are suffering keenly—a fact recognized by William McChesney Martin, chairman of the U.S. Federal Reserve Board of Governors. As a result the Senate Banking Committee has authorized the Federal Reserve to conduct an investigation which is expected to take several months to complete. After which there will probably be months of debating in Congress and little, if anything, will actually be done about it.

Government aims to help **big business** to say in operation even though this is detrimental to the general welfare of the people. Business enterprise exists for the purpose of taking more from the people (in the form of money) than it gives to the people (in the form of goods and services). There is tremendous waste of time, energy, and materials because of duplication of services and because of parasitical occupations such as advertising, banking, and insurance.

Technocracy points out a definite trend toward the failure of the Price System on this Continent. By way of illustration, let us choose two of our major industries—the shoe industry and the manufacture of lights.

The shoe industry started when man first thought of protecting the soles of his feet from sharp stones, thorns, and other harsh substances on the ground, also from coldness and dampness. He made crude sandals of plaited grass, palm fronds, leather, and other materials. Later men learned to make moccasins, boots, and shoes. For many generations each household manufactured its own footwear. Then came the shoemakers, who relieved families of this drudgery and exchanged shoes for other things or for money. The old-time shoemaker turned out shoes at the rate of six pairs a week, working with hand tools. Contrast this with the manufacture of shoes today, using the most modern shoe-making machinery, and you will begin to realize how the production of shoes per man hour has risen. In other words, we can manufacture more shoes per hour by using fewer men and more automatic devices. We could greatly increase the present rate of production of shoes per man hour if we could eliminate the enormous duplication of effort

and waste of time and materials which exists under competitive free enterprise. In a Technate the shoe industry would be consolidated so that only a few factories would be needed to supply the whole Continent with all the various kinds of shoes desired by the people.

The manufacture of lights began when man discovered how to make fire. At first the camp fire was the only source of artificial light. Some one probably conceived the idea of taking a long stick, lighting one end of it in the fire, and walking around with it. Thus torches of various kinds were developed.

Some of the first indoor lights were made by burning oily nuts in clay dishes or by inserting wicks into the carcasses of oily birds. Oil lamps of a great variety of shapes, sizes, and materials came into being.

It must have been a challenge to man's ingenuity when, carrying a torch of an oil lamp outdoors, the wind or the rain extinguished the flame. As a result, he thought of making a boxlike case to protect the light—a lantern. The sides of early lanterns were fashioned of horn, talc, bladder, oiled paper, or thin sheets of transparent mica. When glass became cheaper and more common, flat pieces of glass were used in preference to other materials. Lanterns were in use both indoors and out until candlesticks became popular for indoor light.

When glass blowers produced globes or 'chimneys' for lamps, these, fitted to kerosene lamps, made a steadier, brighter light for reading than candlelight. For outdoor use, lanterns were equipped with chimneys with metal covers for the top.

Kerosene lamps were superseded by gas lights, both indoors and for street lights. At that time, obviously, every street light, whether burning oil or gas, had to be light at dusk and turned out at dawn by a man who either walked along with a ladder and a lantern or rode in a vehicle with an elevated platform.

After Edison produced the first electric light, the manufacture of lights developed rapidly. Glass bulbs for electric lights are now produced at a breath-taking speed. The Canadian Press published the following news dispatch from Ottawa recently: 'Fourteen glass-blowing machines in one

United States firm, each operated by a single worker, produce 90% of glass light bulbs used in that country and all of its radio and TV tubes, except picture tubes.'

Nearly all industries follow the same pattern — a higher rate of production with fewer and fewer employees. The number of man hours required today per unit produced is so much lower than it was a few decades ago that, in spite of our great increase in population, unemployment is threatening our economy.

What is the inevitable effect to be expected from increased use of automation in productive processes? It is not difficult to imagine. Either the already unsalable surplus inventories will continue to increase as ever more automated factories spew forth their products, or said factories will shut down. This may cut down inventories but it will also effectively eliminate numerous potential customers. Neither prospect is welcomed by business, but what use is there in producing goods that can't be sold or in hiring men to do a job when machines can do it better and cheaper. What a choice! If some scheme could only be dreamed up whereby machines could also become customers, there'd be nothing to worry about. So far, though, no such happy scheme has been devised.

The use of machinery and extraneous energy to run the machinery was the first step in the growth of production; the second step is being taken now (and what a long stride it is!)—the use of automation, which may be described briefly as the co-ordination of electronic brains with various machines so that raw materials may be directed by those brains from one mechanical process to the next mechanical process, and so on, until the finished product is automatically inspected and prepared for shipment.

Those who believe they are financially secure on account of their having accumulated enough money to live on for the rest of their lives, or having adequate pensions, or trust funds, or income from stocks and bonds, are living under a delusion.

They think that just because they are reasonably solvent their position will be safe no matter what happens to less fortunate citizens. However, they have lost

sight of the fact that they would not be able to keep the entire economy running by themselves in case most other people lost their jobs through the extensive application of automation. If, therefore, the volume of unsold inventories became so great as to offset the assets derived from sold commodities, the resulting economic crisis would place those with favorable bank balances in positions where they were no better off than anybody else. When a boat hits a rock, a rich passenger is just as vulnerable as a poor one.

The financial security of individuals is only as secure as the Price System, which, as we have seen, is very insecure and inadequate. Government spending and the inflation of business credit, which cannot continue much longer, have been keeping the Price System in use in spite of the fact that it is incapable of distributing technologically produced abundance. Research conducted by Technocracy reveals that what the economists call 'business cycles' are not cycles but progressions toward a state of complete collapse. Each depression has been far worse than the previous one, and the next depression will probably be one from which there will be no Price System recovery.

Technocrats, who have been predicting the failure of the Price System for many years, will be the only people to welcome it; not in an 'I-told-you-so' attitude, but because they realize that only when the citizens of this Continent lack food and other necessities of life badly enough will they awaken from their apathy, cease being Simple Simons in regard to governmental affairs, and begin to comprehend that they cannot catch a whale in a pail. The people will become ready and willing to discard the pail—the Price System—and will begin to install a Technate.

This will mark the end of pail-size operations and the beginning of whale-size, Continental operations, which will provide an abundance of goods and services and distribute that abundance to everyone.

—Edith V. Chamberlain

A Power Complex

Every North American automobile manufacturer is putting the emphasis on naked, brute power. What possible need is there for such thrust in city or suburban driving, limited to 30 miles an hour and so often a bumper-to-bumper, start-and-stop crawl?

HATE TO INJECT a sour note into all the whooping and hollering that's attended the unveiling of the new Edsel car, but surely this is the perfect illustration of the cockeyed conception of the modern American automobile.

We have here, in the low price field, the culmination of what New York's Traffic Commissioner T. T. Wiley recently described as 'a horsepower jag that's as insidious as opium.'

The Edsel's engine is truly a fearsome thing, available up to 345 horsepower.

The local dealer proudly boasts, 'Man, this is the car that's going to put fire on the highways.'

Ron Thornber, our automotive editor, writes of his test drive: 'It's so hot that even a quick nudge on the accelerator spins the back wheels . . . it exploded with unholy acceleration.'

Reprinted from THE VANCOUVER SUN.

True, the car boasts a great many other selling points, but it's this absurd charge of juice that makes it unique in its field and is the ace in the hole of Ford's gamble.

Gamble? Hardly.

It seems more likely a sure thing on this horsepower-happy continent.

In fact the Edsel is no trendsetter and for that reason it is unfair to single it out. Every manufacturer is putting the emphasis on naked, brute power.

It's hard to understand why the consumer should go for this.

What possible need is there for such a thrust in city or suburban driving, limited to 30 miles an hour and so often a bumper-to-bumper, start-and-stop crawl?

What is the use of unholy acceleration in today's traffic?

What is the argument for a speed potential of up to 150 miles an hour when there isn't a high-

way in North America that posts a legal limit over 65?

How can there be any economy in operating a machine with a bulldozer's power that can never be tapped?

And—what's most important—isn't this, in fact, a lethal weapon in the hands of anyone off the Indianapolis bricks.

Thornber is writing of the Edsel, but he could be writing of almost any American-built car when he observes, 'For the man who fails to understand all that power and who, through ignorance or foolishness, abuses it, this car could be as gentle a pet as a striking rattlesnake.'

Consider the implications of this in the light of the number of idiots who are driving today.

The estimated toll of deaths from automobile accidents in the United States this year — deaths, remember—is 40,000.

Four out of five of them, says the National Safety Council, are directly attributable to excessive speed.

That 'fire on the highways' the dealer enthused about is all too often a fatal flame.

And still the race for more horsepower goes on and has now moved into the low-price range.

There's no doubt in my mind that the North American purchaser is in the iron grip of a kind of conspiracy that associates prestige with the size and chrome of what's out there in his garage.

The manufacturers cater to this in every advertisement, linking gracious living social position with their names, just as the booze-makers do.

The result is that designers are no longer creating vehicles for utilitarian transportation.

Though the parking problem becomes more acute wheelbases stretch longer and great useless fins stick out the back.

Though the price of gasoline was never higher the miles-per-gallon of the average car was never lower.

Though the roads were never more choked the average car is built primarily for top performance at surging speed.

And so we find the real advances in practical design being made in Europe with small, sturdy and cleanly-lined cars that can park on a dime, out-manoeuvre every American-built monster and yet still have all the speed that the law allows.

There seems little hope that the technique of American mass production, which might turn out a truly economical and practical car, will be converted for that purpose.

All of the new models for next year, the forecasts say, have more power under their hoods than ever before and so, while the authorities beg, implore and threaten the motorist to slow down and live longer, the manufacturer gives him bigger and deadlier bombs. **—Jack Scott**

★ PORTLAND, Ore.—U.S. and Canadian delegates to the annual meeting of the International Woodworkers of America were told by their president that there is only one answer to unemployment—'a shorter work week.'

A. F. Hartung said it is 'time the AFL-CIO takes the lead to bring about a shorter work week by whatever method is necessary. We must not wait until millions more become unemployed. . . .'

Automation was blamed by the IWA executive for cutting employment 10% as compared with a year ago while production declined only 1.6%, demonstrating that worker output has increased through the use of automatic machinery.

—Associated Press

★ SAN FRANCISCO—A three-month vacation every five years for production workers has been proposed by president David J. McDonald of the United Steelworkers of America.

The vacation plan was one of three suggestions McDonald offered as a means of meeting what he called the 'challenge of automation.'

The alternate plans were a four-day, 32-hour week or a five-day, 30-hour week. 'Automation is an important factor in future union goals,' McDonald said.

—British United Press

★ ATLANTIC CITY—Development of an electronic heart stimulator that could be worn in a shoulder harness has been reported by a team of Harvard researchers.

They said animal tests suggest the possibility the device might be employed to help certain patients who are unable to re-establish a normal heart beat rate following certain surgical operations inside the heart. *—Associated Press*

★ SEATTLE—Boeing Airplane Co., hard hit by air force economies, said it is trying to borrow another $100,000,000 to continue operations.

The company also announced it will close its Everett, Wash., plant by June, throwing an additional 1500 workers out of jobs and eliminating a jig and tool facility started only a year ago. *—International News Service*

★ LONDON, Eng.—Moscow radio has announced that work has begun in Armenia on the world's first solar power station.

Reflection of the sun's rays onto water will produce steam to operate a turbine which will generate about 2,500,000 kilowatts a year, the radio said. *—Reuters*

More May Be Too Many

THE Sun is glad to inform its readers that nowadays a man equipped with the latest-type machine can dig 60 postholes in two-and-a-half hours. Thirty years ago it took 10 hours. This is on the information of the Ford Farming Magazine and is heartening.

It is (of course) another example of mass production and on the basis of all the best arguments is likely to lead to a vastly increased demand for post-holes. Though don't ask us what will be done with the increased production following that demand.

There is a more serious problem than this. Mass production has clipped the time taken to dig postholes. What will it be like with automation ?

Can't you see some weird, robot monstrosity stalking about the world, ordered around by its internal electronic brain, digging postholes like crazy ?

The stores will be full of postholes. You, and you, and you will be pleaded with to 'Buy postholes. Stock up on postholes now.' Manufacturers will eye inventories of postholes with gloom. Banks will refuse loans to manufacturers of postholes because of overproduction. New designs will come out every year for the 'most beautiful posthole ever.' This or that day will be Posthole Day. Posthole diggers will be laid off while manufacturers re-tool. There will be demands for the guaranteed wage for posthole diggers. New uses will be found for postholes to absorb the surplus. An added production problem will be 'do it yourself' posthole diggers. Some of the added production will be plowed under.

And all the time, increasing in skill and productive capacity, the robot, automation posthole Thing will go on digging postholes until the world is pockmarked and pitted and ready to collapse inward.

It is a problem with which the world must grapple. And at once. It is not good enough merely to say that more postholes will offer more politicians an opportunity to sit on the fence.

Reprinted from THE VANCOUVER SUN.

TECHNOCRACY

NORTH AMERICA'S ONLY SOCIAL DYNAMIC

WHAT ?

★ Technocracy is the only North American social movement with a North American program which has become widespread on this Continent. It has no affiliation with any other organization, group or association either in North America or elsewhere.

★ The basic unit of Technocracy is the chartered Section consisting of a minimum of 50 members and running up to several hundred.

★ It is not a commercial organization or a political party; it has no financial subsidy or endowment and has no debts. Technocracy is supported entirely by the dues and donations of its own members. The widespread membership activities of Technocracy are performed voluntarily; no royalties, commissions or bonuses are paid, and only a small full-time staff receives subsistence allowances. The annual dues are $9.00 which are paid by the member to his local Section.

★ Members wear the chromium and vermilion insignia of Technocracy — the Monad, an ancient generic symbol signifying balance.

WHERE ?

★ There are units and members of Technocracy in almost every State in the U.S. and in all Provinces in Canada, and in addition there are members in Alaska, Hawaii, Panama, Puerto Rico and in numerous other places with the Armed Forces.

★ Members of Technocracy are glad to travel many miles to discuss Technocracy's Program with any interested people and Continental Headquarters will be pleased to inform any one of the location of the nearest Technocracy unit.

WHEN ?

★ Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers and economists that become known in 1920 as The Technical Alliance — a research organization. In 1933 it was incorporated under the laws of the State of New York as a non-profit, non-political, non-sectarian membership organization. In 1934, Howard Scott, Director - in - Chief, made his first Continental lecture tour which laid the foundations of the present nation - wide membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing.

WHO ?

★ Technocracy was built in North America by North Americans. It is composed of North American citizens of all walks of life. Technocracy's membership is a composite of all the occupations, economic levels, races and religions which make up this Continent. Membership is open only to North American citizens. Aliens and politicians are not eligible. (By politicians is meant those holding elective political office or active office in any political party.)

★ Doctor, lawyer, storekeeper, farmer, mechanic, teacher, preacher or housewife — as long as you are a patriotic North American — you are welcome in Technocracy.

TECHNOCRACY

Whatever the future of Technocracy, one must fairly say that it is the only program of social and economic reconstruction which is in complete intellectual and technical accord with the age in which we live.

—**Encyclopedia Americana**

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TECHNOCRACY DIGEST

FEB. 38

Ten Mortal Fears

A Look Into the Future

Necessity Demands

The Challenge of Soviet Science

Economics of Automation

Freedom Is Slavery

New Source of Electricity

Computer Can 'Learn'

No. 167

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TECHNOCRACY DIGEST

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FEBRUARY, 1958 **No. 167**

STAFF

DONALD BRUCE.....*Editor*
MILTON WILDFONG.....*Assistant Editor*
RUPERT N. URQUHART, *Assistant Editor*
ED BRODERICK.....*Assistant Editor*
JANE URQUHART....*Circulation Manager*
HELEN SLATER.....*Business Manager*

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The Quarterly Survey

Unemployment Up

Unemployment in Canada reached a new postwar high in early January.

Figures given to the House of Commons in Ottawa by Labor Minister Michael Starr showed 796,371 persons looking for work with the National Employment Service, the largest number at any time since 1940 when the government agency was established.

While the total does not indicate absolute unemployment, it was accompanied by other figures estimating a new mid-December high of unemployed at 386,000, a jump of almost one-third in a month.

President Claude Jodoin of the 1,000,000 - member Canadian Labor Congress commented: 'We are faced with a situation the seriousness of which can hardly be exaggerated.'

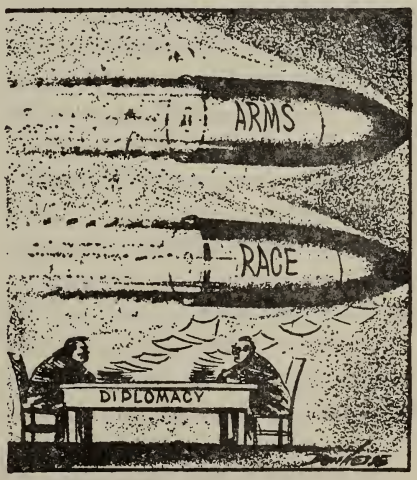
U.S. Secretary of Labor James P. Mitchell has predicted that more than 4,000,000 Americans will be out of a job during February. This would be the highest unemployment figure since 1950.

The number of jobless in both countries is expected to rise still further in the months immediately ahead.

Technocracy states flatly that there is no cure for the problem of unemployment under the present Price System.

More in Service Jobs

More and more Canadians are being employed in 'service industries' in proportion to those working in production fields, according to the Bank of Montreal's business review for November, which



Toronto Daily Star

Whoosh!

summarizes a 161-page study of the subject undertaken by the bank for the Royal Commission on Canada's Economic Prospects.

Today, the review says, 45% of the labor force is employed in service industries, 'generally regarded as comprising all those sections of the economy that do not produce goods but do provide a service of some kind.' This proportion, which continues to increase steadily, compares with 18.5% in 1881, 28% in 1901 and 38% in 1931.

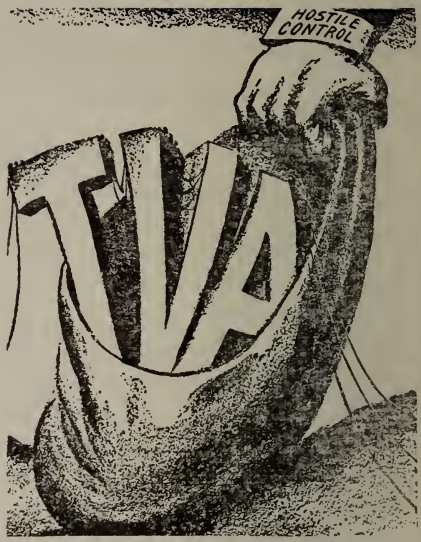
Problem of Plenty

In 1958, as in past years, a big problem is resting on the doorsteps of the U.S. Congress and the Canadian House of Commons.

That is the problem caused by the ability of the North American farmer to produce more and more food and fiber.

In spite of all the attempted solutions — rigid price supports, flexible price supports, acreage allotments, marketing quotas, marketing agreements, the Brannan plan and the 'soil bank' — farm products are still in surplus.

Year after year, the ability of farmers to increase production per acre, per cow, per sow has



Fitzpatrick in The St. Louis Post-Dispatch

"We've Got It in the Bag, Boys"

thwarted the best-laid plans of politicians and agricultural officials.

How many more years will it take the citizens of this Continent to realize that the Price System and plenty are absolutely incompatible? **—The Editor**

A PRODUCTION MICROMETER that sorts and measures 10,000 miniature parts an hour at tolerances as fine as .00003 is being manufactured by Affiliated Manufacturers Inc., New York. The Roller Mike sells for $1250 and the manufacturer claims that it pays for itself in weeks by speeding up production.

Ten Mortal Fears

As we start the year 1958, *our leaders are bedevilled by ten mortal fears: political incompetence, economic incompetence, abundance, loss of economic supremacy, isolation, science and technology, military weakness, losing the next war, propaganda failure and social change.*

AS THE YEAR 1958 makes its appearance on the calendar of time, and as we turn our attention to an appraisal of the social situation on this North American Continent, we note that the most prominent features are the eminences of fear that rise above the haze of routine and contingent trivia that make up the bulk of human living.

Of course, these fears do not prevail with much clarity among the people at large; for, the general populace is primarily preoccupied with details which affect the respective individuals, who are only mildly concerned with the greater strategic factors that dominate the society as a whole. Nevertheless, in the background of the personal, individual concerns of the common people — their economic, social, health, and legal problems—there is a vague and fearful awareness that all is not as rosy as the Happiness Boys would have them believe.

Even the leaders of national and world affairs are dulled in their appraisals of the strategic situation by hopes, desires, stylized concepts, and mental blocks. Yet, intuitively even more than statistically, they are beginning to sense the presence of accumulating trends which fill them with fear for the immediate future. They see these 'menaces' as clouds and pinnacles rising into the skyways of this jet-propelled age; and they feel that calamity can come suddenly and disastrously.

There are numerous secondary fears and apprehensions which affect only tactical details of the general social situation. But we shall by-pass those at this time and focus attention on only a few of the fears of strategic value which dominate the horizons of early 1958.

Fear of Political Incompetence

Ever since the founding of the new American nation in 1776,

there has been an uneasiness regarding the competence of this 'revolutionary political experiment.' This apprehension has exhibited different aspects to different people, mainly according to their positions of advantage and economic success in the society. Those apprehensions are now growing into outright fears, with panicky overtones.

The big economic interests have always feared that control of governmental affairs might slip out of their hands and into the hands of the people at large. While the political systems of the United States and Canada are nominally republican in structure and allegedly democratic in operation, there is, among the social elite set, a growing dread that they might become so in fact. This fear developed almost into a hysteria under the administration of Franklin D. Roosevelt, when he attempted to loosen some of the rigidity of McKinley-Hoover republicanism—even though he did so in the name of expediency for the purpose of preserving the status quo. This expediency, albeit mild in its application, appeared for a while to be giving the public a break, and this was abhorrent to the privileged minority. They now dread the probability of having to make new concessions to the public, possibly under the guise of emergencies brought on by an economic recession.

On the other hand, from a different aspect, is reflected the fear of democratic failure by those who espouse it in principle. This fear besets the liberals and other proclaimers of faith in the democratic process. It is based in part on the ruthless arrogance of the economic elite in forcing their program on the nation and in part on the general suspicion that the public is so ignorant, so indifferent, and so fickle regarding major social issues that its vote represents a very dubious technique of governance. Because their concepts permit them no other avenue of progress, the liberals trust that, somehow, the public can be educated (or at least persuaded) by words of explanation and rational argumentation (leavened with a certain amount of piety) to the end that it will become informed, judicious and benevolent. This hope must eventually find its niche in the Hall of Failures along side of the hope for the Good Moral Life.

Those elements of the population which control national affairs at present much prefer to operate under a monarchy, wherein resides a stable and conservative authority to which they may tie their social status, their fortunes, and their exploitive advantages. Next to a monarchy, they prefer one-man dictatorships, albeit these hold power by virtue of bribery, force, and terror and are always subject to sudden overturn. This conclusion is obvious from the list of political regimes which the United States most wholeheartedly supports and protects — incidentally, mostly from internal popular resentment. It is highly doubtful that the governments of Francisco Franco, Oliveira Salazar, King Paul, Ibn Saud, Chiang Kai-shek, Ngo Dinh Diem, and a number of the Latin American dictatorships could long survive without American backing in the form of 'advisors,' finances, and arms.

Now it is evident that reactionary political regimes are incompetent to meet the challenges of a dynamic technological age. The reactionaries like to think that the answer to our political inefficiency is the appointment of a 'czar' to rule over this department or that. No doubt, they even have a sympathetic appreciation for the function of a commissar; for, although he functions under the banner of an 'evil' competitor, he is still their peer.

As we shall note later, the deepest anxiety of the reactionary administrators is focused elsewhere than on politics as such; and the same kind of anxiety must also beset the commissars of Russia. However, politics in itself, as a means of social control is proving incompetent, both as to meeting the problems that arise and as to claiming the respect of the governed people. Politics, whatever its form, is nearing The Brink and no way of reversing this course is in sight. Political people, indeed, have reason to be fearful.

Fear of Economic Incompetence

Political governments generally are concerned, primarily, with refereeing their respective national economies. They are particularly interested in that phase of the economy known as the rakeoff and with the disposition that is made of it. In fact, all political governments participate in this department of the econo-

my, taking a rakeoff of their own in the form of taxes and other levies. Political governments tend to become governments of, by, and for the economic predators.

But economic systems which encourage p r e d a t i o n(and we know of no exceptions under the Price System) are certain to become troublesome to their respective social areas. Practices within those s y s t e m s lead, sooner or later, to internal conflicts or international wars. This happens even under the 'best' of conditions.

The United States has experienced fewer major conflicts than most areas, mainly because its rapid rate of economic expansion was sufficient to cover up the discrepancies from one year to the next. Consequently, the watchword of the American economy has been 'continuous expansion.' Our political and economic leaders can envision the future in no other terms; and they are bedeviled by a perennial fear that, should the economy ever level off, the system would be incompetent to handle the job at hand, or even to survive.

A major tendency of the economic system has been to concentrate wealth into the hands of a few and to bring the vast majority into perpetual poverty. This tendency has been somewhat obscured by the rapid rate of expansion, but was brought i n t o sharp focus during the Great Depression of the 1930's when there was an e c o n o m i c contraction rather than an expansion. It became clouded over again during and following World War II by the accelerated n e w expansion set off by the grandiose amplification of credit committed in the name of defence. The economy was further relieved by the fact that much of the produce was destroyed (both by war and by design) rather than poured into the channels of commerce.

The Free Enterprise system of America is now on the defensive and its Wise Men are not too sure that it is the most efficient economic system on earth, although they keep saying it is. The 'experts' both in and out of government realize that any form of contraction in the e c o n o m y now would spell the end of the recent prosperity binge, at least; and it might even mean the end of the Free Enterprise s y s t e m as a whole. Their particular fear is

that Free Enterprise might be supplanted by socialism.

However, the economic leaders have built up such a fear and hate of socialism in the country that there is grave danger that the leadership of America would rather plunge the nation into catastrophe than consider socialism as a successor to Free Enterprise. Not only does this attitude prevail among the economic elite, but it has permeated the labor unions and the clergy to such an extent that they have aggressively weeded out their 'leftist elements' and have openly espoused reactionism.

Thus, one of the great strategic fears of the coming year is the fear of an economic depression—bigger and more conclusive than any other depression in our history. Already, signs of hysteria are developing in Washington and other financial centers. But, so far, the only antidote being considered is more government spending for armaments, the expenditures financed with an unbalanced budget.

Fear of Abundance

A new factor has entered into the economy of America to terrorize its administrators. This terrible new factor is abundance. If it were not for abundance, it is conceivable that the Free Enterprise system could survive for a long time in spite of its discrepancies and contradictions, albeit no doubt with periodic 'hard times' for the citizenry. But abundance is the one thing which the Price System as a whole cannot tolerate. It is the one 'ailment' that is 100 per cent fatal.

Consequently, every effort is being made by the government, by business, and by the other upholders of scarcity values to manipulate the economy so as to offset the effects of actual and potential abundance. The government is buying up huge amounts of 'surplus' agricultural produce and keeping them off the market. The steel industry, boasting a productive capacity of some 140 million tons per year, is now operating at about half its full capacity—in order to avoid an abundance of steel and to hold up the price. Such measures are, at most, temporary expediencies.

The national leaders are terrorized by the long term implications of abundance. They fear that scarcity is getting out of hand; but their concepts will not permit

them to accept and adapt to abundance.

Fear of Losing Economic Supremacy

Closely related to the fear of economic incompetence at home is the fear of losing out in the struggle for domination of the world's commerce. Following World War II, the United States held a virtual stranglehold on the world. We tried (with temporary success) to dictate which nations could trade with which other nations and with what kinds of goods and in what quantities.

With our war-expanded productive capacity available for producing articles of commerce, our industry spewed forth shoddy goods by the millions of tons and these were hurriedly spread around the world. In fact, foreign trade was given a higher priority for American production than were the American consumers themselves. You probably still remember how difficult it was for citizens of this Continent to get new automobiles and nylon stockings, for example, right after the war, while these items were being exported abroad by the shipload. Such exports sopped up the ready cash of the rich foreigners, particularly the luxury-hungrey elite 'refugees' and war profiteers; and they were further underwritten by foreign aid and give-away programs, federal and private.

But, in spite of all the advantages acquired by the United States, the economic tide has gradually turned against us. America's political and business economists lacked long-term strategic intelligence. They naively tried to build up a world-wide demand for American consumer goods among people who had neither the purchasing nower nor an appreciation for those goods. For example, how can you expect people to develop enthusiasm over American electrical appliances when they have never had the use of electricity in their lives and still have no facilities for producing it? It is absurd, even granted they had the money to pay for the stuff, which most of them don't have. Their urgent demands are much simpler and more primitive.

Other countries, such as Japan, Britain, Italy, Czechoslovakia, Russia, and Brazil, were forced to view the world economic situation more realistically. They did not have the capital or the tech-

nology to compete with America in mass production. But they found they could outcompete us in two general categories of goods which were soon to be in demand everywhere, including the United States. These categories were (1) cheap but serviceable utility goods of all kinds and (2) high quality precision equipment.

The United States not only refused to produce the kinds of goods most in demand around the world, but it also insisted on a wider spread between production costs and sale price. As a consequence, the goods of other countries are beginning to dominate world markets and are even flooding this country far below current American prices. Now that Russia's technology is built up to the point that it can manufacture for export, the Soviet Union is becoming our chief competitor in world trade, particularly in Asia and Africa. Hundreds of American freighters are lying idle for lack of overseas business.

Fear of defeat in the economic 'Cold War' was one of the chief concerns voiced by President Eisenhower in his recent State of the Union speech.

Fear of Isolation

In its economic adventures, the United States has proceeded on the assumption that it had the right and duty to go out around the world and grab off whatever resources it wanted with only a minimal payoff to the 'native' populations, usually in the form of bribes to the ruling big-wigs. Madison Avenue descriptions of the greatness and the glorious prosperity that are to bless America for the next 25 years (at least) are predicated upon our having a free hand in acquiring for ourselves some four-fifths of the earth's production of resources. The heralds of everlasting prosperity and continual growth do not conceive of the possibility that foreign resources may soon become closed to American exploitation. But the first twinges of fear are beginning to be felt by a few of our more sober economic leaders. This is a fear that surely will not lessen as time goes on.

Other nations are building up a demand for resources far in excess of anything they have required previously. All over the globe, power plants are being thrown into production. Much of

this power is used to run factories; and, in order to run factories, people need resources. Foreign people are also conceiving the idea of utilizing some of their production to enhance their own standard of living, and that realization creates a boom demand for added resources.

The idea of nationalization of resources, power, and industry without compensation to the owners, foreign or domestic, is 'catching on' in the world. This means that the days of profitable foreign investments by American private enterprise shall soon come to a close—and the Marines will be helpless to save them. Who, then, will get the world's resources?

The first call on a nation's resources will be that of the domestic industry; and, after that, the surplus will be bartered to other nations in exchange for other needed resources. It is not likely that many raw minerals will flow freely through the channels of exploitive commerce. Rather than shipping its resources abroad, each nation will tend more and more to make them up into finished goods; and it will be the goods which are exported, if anything, not the minerals. The warning signs are already up, and our leaders will have plenty of reason to be afraid as soon as they learn to read those signs.

If the United States is ever forced to retreat within its own boundaries and to seek there the materials used by its industries, we shall have to adjust rapidly to the status of a second-class nation. Our present greatness is, in large measure, built upon the predatory leaching of other areas; hence, we are in no position to go it alone on a self-contained basis.

The only answer to this contingency is that which Technocracy has long advocated: The consolidation and integration of the whole Technate Area into one operational unit. This Area can become self-contained and self-sufficient, but the United States alone cannot. No matter how long the solution is delayed, and no matter how much the factors are juggled around, t,he ultimate answer remains the same.

Fear of Science and Technology

The United States once had a technological potential and capability that far outranked that of any other area of the earth. Now, we are not so sure that we rank

first; and, what is more significant, we are afraid to develop the full potential we do have, which is still very great. The leaders of our society have a morbid fear of science and technology and they prefer not to see them utilized to their fullest extent. They fear that scientific knowledge will undermine the old values founded on superstition and philosophical 'wisdom.' The present political administration of the U.S. is particularly fearful of science, as reflected in repeated statements of Eisenhower, Dulles, and Nixon. Theirs is a world of philosophical values and make-believe which cannot stand up in the light of facts and an objective understanding of nature.

Science has been like a hurricane of destruction to the old concepts and beliefs once cherished as Sacred Truths; technology has changed man's ways of doing things and thereby provided him with physical wealth never before considered possible or desirable. To the high priests of the Old Order, science is a curse upon the world and technology is a tool of Satan.

Perhaps more deplorable than the effects of science on philosophical make-believe are the changes wrought in the economic field by technology. The old patterns are being completely altered. The Old Order was based on human toil, poverty, and degradation. The leaders of the Old Order gloried in the sight of subject people scurrying around like ants. The farmlands once were infested with busy workers. The early factories were swarming with toiling humanity. This gave the leaders a sense of power and authority. But now, when huge projects are completed with only a few elite employees, and when large factories are operated almost without workers, it is enough to give the old leaders the willies. Further, things seem to be getting out of hand for them in a number of ways. Innovations of a competitor often render obsolete something that has flourished for many years. The problems and circumstances of administration keep changing. Their comprehension of the operations and interrelationships becomes muddled. The conservative leaders yearn for the 'good old days' of cheap and abundant labor, stable economic conditions, and negligible

change. Science gets blamed for the change.

Consequently, the leadership of America consistently and persistently has tried to downgrade science and ridicule scientists. It has eulogized and glorified the businessman, the politician, the financier, the entertainer, and the priest; but it regards the technical men as 'eggheads.' The McCarthy-Nixon purge of scientists in America was merely a more than usual rabid expression of the general official attitude.

Politics, whatever its brand name, is incompatible with science. At the showdown politics must go. This is as true in Russia as in the United States. No doubt the commissars are as fearful of science as are the bureaucrats. For whatever consolation it may afford, the Old Guard of the United States is not alone in this fear of coming developments.

Fear of Military Weakness

Ever since they moved into the fighting of World War I to help mop up that 'mess' in Europe and protect investment values, the people of the United States have felt that they were invincible as a military power—that no nation on earth could possibly defeat the great United States. We may have had certain reservations about the efficacy of Christian morality and democratic principles as factors in achieving military victory, but we have never had any doubts about the efficacy of our technology, our resources, and our manpower. As a consequence, the American public approached the war with Japan in 1941 with the belief that it would be a six-weeks' job. Although this superiority complex was given a sizable set-back during the progress of the war, the dramatic climax of the victory was such as to restore our confidence in our military prowess. So, when we catapulted ourselves into the Korean War, it was generally assumed that victory would be ours in a matter of a week or two, if not sooner. Then, through the long-drawn-out struggle of the Korean War and its final stalemate (although conducted against 'inferior' and 'backward' Asiatics), we became aroused to the realization that America is not totally invincible. However, we consoled ourselves with the rationalization that we held back our most effective weapons and that General MacArthur had been fired in order to

limit the scope and cost of the war.

America's self-satisfaction with its military capability following World War II was based largely on the belief that we were in sole possession of Atomic Bombs as well as the know-how and economic capacity for making them. In fact, we were convinced that we were some 50 years ahead of the nearest competitor. This self-assurance was short-lived with the rapid success of Russia in producing a similar bomb. Then we jumped ahead again with the Hydrogen Bomb, only to have the Russians catch up with us again in a matter of months. Since then, we have watched the Soviets move out ahead of us in one field of military capability after another. In spite of repeated assurances from the president, the secretary of state, and the military brass that the United States is still really ahead of the Russians at least in striking power, there is much skepticism that such is so and there is a growing fear that it definitely is not so.

Fear of Losing the Next War

America's reliance at present is on its Strategic Air Command of heavy bombers, operated mainly from overseas bases around the Soviet Union. We are given assurances for the future, however, that America will outdistance the Russians in the development of long-range missiles as well as other defence weapons. But, after the events of the last quarter of 1957 few people take such assurances seriously. From the street corners to the halls of oratory to the posts of military command, there is a pervading fear — fear that, in case of a showdown, America will lose the next war. In our more expansive moods, we may feel that the Russians are not quite capable of defeating us outright; rather, we fear, it will be a war of mutual annihilation. When we are not feeling so good, we tend to cringe in fear of the dreadful fate that surely awaits us—in spite of reassurances of Civilian Defence that we may have as much as 30 minutes to get out of the target area in case of a surprise attack. Nor are we much impressed by the promises being circulated by the military public relations officials that in another two years, plus or minus, we will have developed the means to detect and destroy intercontinental missiles while they are still

in flight. The cynical answer to all this assurance is, 'You tell them, brother!'

Among the factors which likely would contribute to a defeat in a war with Russia is the incapacity and reluctance of our so-called allies in the Cold War. As a Sunday afternoon exercise, you might go over the list of these allies and mark down which ones would be able and willing to stymie a determined Russian advance. For your convenience, here is a more or less complete list: South Korea, Japan, Taiwan (Formosa), Philippines, South Vietnam, Thailand, Pakistan, Australia, New Zealand, Saudi-Arabia, Jordan, Iran, Iraq, Lebanon, Greece, Turkey, Italy, Spain, Portugal, France, West Germany, Benelux, Britain, Denmark, Norway, Iceland, and Latin America (Some 18 nations and 'nacionitas' plus dependencies). Even if the leaders of these allies can be bought, how about the people? It would be more realistic to regard them as deficits, liabilities, and handicaps rather than as allies.

Almost everyone in the forefront of national affairs, particularly those responsible for past and present decisions and policy, is pointing the finger of blame at other specified individuals, departments, administrations, or political parties. But they are not blaming these others for getting the United States into the Cold War or the arms race. All they are irritated and worried about is that we were 'prevented' from keeping ahead of the Russians in the field of military competence. Their main concern now is that we may never be able to catch up with the Russians, much less surpass them, in annihilative capability.

Only a few Americans (mostly scientists) deplore the arms race enough to speak out against it. The liberals, the moderates, the conservatives, and the reactionaries are all frantically demanding that more money be spent more effectively in meeting the 'Russian challenge.'

The fear that America has lost the arms race and is in danger of losing Worll War III is developing into almost a hysteria at this time. The national leaders are getting a case of screaming meemies over missiles.

Fear of Propaganda Failure

During the Twentieth Century, America achieved supremacy in

the employment of propaganda and the mastery of its techniques. Our own people, thanks to advertising and the mass media of communications, are undoubtedly the most propagandized people on earth.

Our leaders are doped with the faith that words, jingles, and animated cartoons will hypnotize the American people into taking immediate and positive action—to rush out and buy a specified commercial product, accept a certain Truth, to join in a Crusade for a specified principle. The radios and televisions blare forth this propaganda repetitiously at short intervals all day and most of the night. And how does it affect the motivations of the listeners and viewers? At the first excited pitch in the voice of the announcer, indicating a forthcoming 'pause for an important message,' they take time out to go to the toilet.

America has made the mistake of presuming that what is said about something is far more convincing than the thing itself. Unfortunately, we have tried to conduct international relations on the same presumption, with the result that our veracity is subjected to disdain all over the world, even at home.

There is a technique of propaganda that requires no words at all, yet it is overwhelming in its effectiveness. It is the technological technique. Let a nation design an advanced piece of machinery, build a superbly engineered structure, or devise an effective method of combatting some disease; these carry an impact around the world. They need no words to carry their message. The two Sputniks launched by Russia in late 1957 produced far more propaganda effect than the millions of words broadcast over the Voice of America and Radio Free Europe combined, with the balloon messages thrown in for good measure. In the eyes of the world, the Sputniks sank the United States to a second class power.

The steel mills of China and India; the precision equipment produced by Sweden, Czechoslovakia and Switzerland; the great dams and power stations being constructed in Russia, China, France, and India; the 4000-mile grid of direct current transmission lines being installed in Russia—these speak a language

that people understand and appreciate.

The swept-wing cars of '58 pouring out of Detroit may be works of art, but they are not outstanding propaganda achievements, not to a world which can better appreciate the simple, efficient, economical little cars of Europe.

America's leaders are desperately afraid that they are losing out in the propaganda struggle for men's minds. This fear dominates almost everything they do in the public relations field at this time. In fact, they are more afraid of a propaganda flopnik than they are of a Russian Sputnik.

Fear of Social Change

The grand fear in the background of all other fears of 1958 is the fear of fundamental social change. This grows out of the suspicion that, perhaps, after all, the American Way and its proclaimed virtues might be invalid and untenable. Our political, economic, and social leaders have 'gone for broke' in support of the old values, and most of them would almost as soon drop dead as admit, for instance, that the Technocrats were correct all along.

If the system could be manipulated in some way that would retain the essential features of the Price System, notably politics, business enterprise, and social distinctions, many of these people probably could reconcile themselves to a moderate degree of change. But we can look for them to fight to the last ditch any change that would involve the replacement of politics with functional control, any distribution of abundance to all citizens without price, and a status of social and economic equality for everyone. They will yield their positions only to a social force of such magnitude that they cannot stand up against it. Theirs is not so much fear that that force will come from the outside as from within the society of this Continent.

For a time, it appeared on the surface that science, technology, and the endowments of nature favored free enterprise, laissez faire politics, and the pious life. The Great Depression once shook their faith in this facade severely, only to have that faith restored by the credit expansion of World

War II. Then, with everything of the last decade seeming to validate the hopes and beliefs of the Price System devotees, the old magic started going out of the system. The best tricks in the book have been tried. What is there left to try? Even the surest trick of all — war — is losing its appeal.

If this were merely a tactical problem, it probably would be met with the glib remark, 'the scientists will find a way.' But the question of social mechanics as a whole is one that the Price System leaders do not want answered by science.

But the strategic answer to the great problems of the North American Continent must come from science—from the application of science to the social order. In other words, the answer is Technocracy. But Technocracy is not just a remedy for a dilemma. It is an entirely new design and a new social technique, one that will provide mankind with physical abundance and well-being beyond anything dreamed of by the philosophers during their wildest hallucinations. But these things are measurable, predictable, and fully capable of fulfillment on this earth and during this lifetime.

Let the tyrants of the Price System cringe in fear. It is a hopeful sign that the Old Order is passing and that a New Order of the Ages is about to be born.

For those of you who are not afraid of science and the abundant life, this is not a time for fear, rather, it is a time for encouragement and renewed endeavor.

Technocracy welcomes you to the fight. **—Wilton Ivie, CHQ**

★ MONTREAL—A system of fluoroscope examination by remote control—believed the first of its kind in the world—was demonstrated recently at Jean Talon hospital.

The apparatus uses a motion picture camera and television equipment and was developed by Dr. Guy Duckett, radiologist at the hospital, and Dr. Albert Jultras, professor of radiology at the University of Montreal.

Dr. Duckett said that the apparatus has the advantage of enabling the radiologist to work in a lighted room separate from the patient. It protects the operator completely from X-ray exposure, he said. —*Canadian Press*

★ OTTAWA—Business failures were 25% higher in the first three months of 1957 over the corresponding period of the previous year.

The bureau of statistics reports failures rose to 616 from 491 while liabilities rose 7% to $20,109,000 from $18,867,000. Average liability fell to $32,600 from $38,400. —*Canadian Press*

Necessity Demands

A study of history shows that most inventions and social advances had uphill struggles against stubborn resistance. Invariably, though, when the necessity for change became great enough, its demands have overcome all opposition. So too will it be with Technocracy.

THE old maxim that 'Necessity is the mother of invention' is a masterpiece of understatement as applied to the hoard of scientific and technological discoveries which has eventuated in today's standard of living in the two centuries since the practical development of the steam engine. While many North Americans try to kid themselves and others that this current result is the product of great vision and planning, the actual fact of the matter is that most life-enhancing inventions had a tough uphill struggle against stubborn resistance. In some cases the resistance stemmed from a long-conditioned human reluctance to surrender the inefficient familiar for the efficient unfamiliar. More often it resulted from the scarcity limitations of the Price System. Invariably, though, when the necessity for change became great enough, its demands have overcome all opposition.

Out of the need for a faster, cheaper way of removing ground water from British mines came the invention of the steam engine which opened the door to the first Industrial Revolution. Supplanting much musclepower with the steampower derived from the burning of coal, this innovation transformed life first in the land of its origin and then in North America to which it was soon introduced. A particularly fortunate agglomeration of energy sources and raw materials on this Continent combined with the exuberance of its colonizing citizenry to give this land area an early material advantage over less favorably endowed Britain and other countries of western Europe.

Almost overnight muscle-operated manufacturing equipment was rendered obsolete, so mechanized equipment had to be designed to keep pace with that

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OBSERVATION - STUDY - ANALYSIS - REPORT.

RESEARCH BULLETIN

FEBRUARY, 1958 | *Compiled by Editorial Staff* | No. 111

New Source of Electricity

WHAT looks like the most significant step yet taken toward one of the electrical industry's age-old goals—the direct conversion of heat energy into electrical energy—has come out of the General Electric Research Laboratory at Schenectady, N.Y. It's a revolutionary new electronic device known as a thermionic converter.

As yet the device has no commercial application, according to Dr. Guy Suits, GE vice-president and director of research. But what it promises for the future is something like this: Extremely high temperatures (such as someday may be available from atomic power plants, the exhaust of jet engines, or even the sun itself) can be converted directly to electricity without the use of any intermediate machine, such as a steam turbine.

The GE device takes advantage of the fact that, under proper conditions, electrons can be 'boiled out of a hot metal surface,' and used directly to produce an electric current.

Though commercial application is still far off in the future, the scientific impact of the new device is great. Already, by this method, experimental converters have changed more than 8% of applied heat energy to electric power. Researchers are confidently shooting for

a 30% conversion efficiency—a figure that would compare favorably with the 40% rate of modern steam turbine generators.

Long Search—For many decades man has struggled with the heat-to-power conversion mystery. An ordinary flat-iron, scientists reasoned, converts electricity into heat with high efficiency. Why couldn't a means be found to turn the conversion in the other direction—directly from heat to electricity?

Some attempts at direct conversion have been moderately successful. The thermocouple and the thermogalvanic cell, for example, have been useful in converting heat to electricity in special situations where ordinary electrical sources are unavailable or impractical, and where efficiency is unimportant. Solid-state semiconductor materials are also being considered as another possible way to lick the problem.

None of these, or any other current approach, however, gives promise of providing anything like the efficiency that the 'thermionic converter' would seem to offer.

Smooth Path—The GE experimental converter combines several well-known scientific principles. In simple terms, it comes down to this: A system in which a hot electrode (above 2,500F) is made to emit electrons, and a colder (though still red hot) electrode is set up to collect them.

The basic trick, says its inventor, Dr. Volney C. Wilson, was to find a way of smoothing the path of the electrons between the two electrodes, so as to lose as little energy as possible. GE seems to have found the answer by (1) working out a new design for the converters' electrodes, and (2) setting up a special gas environment within the envelope that encloses them. The gas environment results in a more efficient flow of electrons than was ever before possible. And the new electrode design permits a coolant (in this case an inert gas) to be run through the collector electrode—thus keeping its temperature somewhat lower than that of the electrode emitting electrons.

Dr. Wilson explains the importance of smoothing the path of the electrons by a simple comparison. Boiling electrons out of the hot electrode and into a cooler one, he says, is analogous to lifting water

to the top of the hill, then running it down the hill to make it do some work for you. To get it to do the best work, you have to help it run down the hill as straight as possible.

Getting Through a Crowd—You might compare the path-smoothing to helping a man make his way through a crowd. Electrons on the hotter electrode are boiled off its surface into the surrounding atmosphere by the trillions. But when any single electron heads out into such a crowd, it tends to be repelled by its similarly charged mates and is thus forced back.

The trouble any electron has in making its way from one electrode to another (called technically the 'space-charge effect) could be compared to the trouble a single man has in crossing Grand Central Station through a large crowd of people. Not only are all the other people physically there (blocking his progress) but (because like charges repel) they would all be pushing against him.

To get around this problem in the case of electrons, GE essentially has set up positively charged ions in the atmosphere between the electrodes in its converter. Each positive ion acts as a policeman, allowing millions of negatively charged electrons to get across to the other electrode—thus causing a flow of current between them. Why positive ions permit negative ions to get across from one electrode to another was first explained by the late Irving Langmuir, GE's famous Nobel Prize winner—the man to whom Dr. Wilson credits much of his success.

What It Can Do—Because of the experimental state of work with the thermionic converter, GE is loath to predict when — or where—the device will find its first application. Three watts per square centimeter of hot surface is the greatest power yet gained from this type of heat engine.

That means that something in the order of 2-volts cells is probably what someday may be expected of thermionic converters. A great number of cells, however, could easily be connected together in series, Wilson maintains. And—provided the heat source remained high enough—direct electricity from heat may someday become a reality. **—Business Week**

A Look Into The Future

HOW would you like to own a two-way wrist radio? What would you think of turning on your lights at home by a mere wave of the hand? How would you like to commute to work by helicopter or drive an atomic-powered automobile?

This sounds more like the world of Dick Tracy, but these are a few of an amazing array of new conveniences slated to make their appearance in the near future on the American scene.

A look into the potential scientific developments of even the next 20 years is not just an intriguing experience. It is an absolute necessity if proper planning is to be made for a nation that is busting its seams in all directions. Every day 11,000 births add to the country's population. By 1975 the present census of approximately 170,000,000 persons is expected to expand to well beyond 220,000,000.

One of the most comprehensive summaries of some of the ingenious developments that lie ahead was given recently by Arch N. Booth, executive vice-president of the Chamber of Commerce of the United States before the National Association of Radio and Television Broadcasters. It was based on information furnished by some of the leading American industrialists as to what they anticipate in the future.

Some of the innovations reported here are already limited in use; others are in the experimental stage; a few still lie in the dream world. The importance of their mention here lies more in the advances they portend, as fresh discoveries open a more opulent existence for everyone with fewer physical tasks and more pleasant living.

Food, being an essential for human progress, was the first item mentioned by Mr. Booth in an illustrated discourse. There will be plenty of it in another 20 years, he says.

To be sure there will be less and less land per capita. But smaller plots will produce even more food and fiber because more is known of how to overcome natural deficiencies in water and minerals in the soil.

The housewife will delight in Mr. Booth's description of the

grocery store of the future. It will appear to have no doors. Its entire front may be open, with the outside separated from the inside by only a curtain of air—cool in summer and warm in winter.

Prepacked foods will be equipped with chemical heating or cooling units that will make possible the cooking or chilling of the product in the package. And there will be no lengthy waiting at the check-out counter. An automatic computer will figure out the bill as items pass under an electronic eye.

What kind of home will the housewife bring home her food to? Many homes, according to the national home builders, may do away entirely with walls between living room, dining room, and kitchen. Private electric companies say there will be available for each home enough electricity to do the work of 100 servants.

High-frequency beams will light up with the wave of a hand before a light-control panel. No switches—no buttons. Intensity of light will be controlled similarly. Fluorescent lights will drench decorations and furniture with blending and contrasting colors.

Automatic eyes will close windows and doors as the weather changes. Ultrasonic waves will do cleaning without mechanical agitation in new-type dish and clothes washers. High-frequency radiation will dry the dishes and clothes and sterilize them. Twist a dial and the clothes will move into an adjoining automatic ironer.

The electronics industry foresees general use of gadgets already being used to change channels on your TV set without the necessity of your leaving your chair. The TV of tomorrow—a thin wall screen—will be controlled remotely from a small box on the table. For home entertainment, a tape recorder and portable TV camera will record pictures on tape and play them back on the family's picture-frame TV.

How about the city of tomorrow? As envisioned by the cement industry, lightweight concrete of great strength will make possible buildings of this material 40 stories high. It will also provide wide-spanning bridges without intermediate support and vast concrete domed auditoriums.

Within the city pedestrians will leave their cars at fringe parking lots and step onto a conveyer belt that will carry them underground

to continuously moving conveyer carriages that will transport them rapidly into the city proper. In the city conveyer belts will be used to carry shoppers from store to store. Similar conveyers will be used at airports, railroad and bus terminals.

Steel producers talk of a new product that will make possible a gas-turbine-powered automobile on a mass-production basis. Even more highly specialized steel may aid in developing an atomic-powered automobile — to be equipped with electronic devices to alert the driver to poor road conditions far ahead, plus an automatic 'brain' that will park the car.

The lumber industry envisions growing trees that will be injected with hormones, radio-active materials, and other stimulating substances to pre-season the wood, give it fire-resistant qualities, and—of all things—stain the wood in desired colors while the tree is still growing!

Railroad officials talk of future atomic-powered locomotives. In fact the Atomic Energy Commission already has approved the proposal of one railroad to look into this possibility.

Air-travel executives have all kinds of new wonders on their drawing boards. One is a proposed jet-propelled freight plane capable of carrying a 100-ton payload at a speed of 600 miles an hour. Another is a plan for 200-passenger airliners that will make the Washington-to-Paris flight in less than three hours at 1,200 miles an hour 50,000 feet up. For short commuter flights, 30-passenger helicopters are planned that will pick up passengers at a terminal and take them to work at three miles a minute.

Perhaps most important of all new schools with more outdoor work and play areas are planned. Self-contained classrooms will be equipped for the use of films, television, recordings—literally to bring the world into the classrooms. **—Christian Science Monitor**

★ PARIS—The Paris underground railway system has stated that it is experimenting with unmanned 'teleguided subways.'

A spokesman added that the first results have been encouraging but that the tests might last several years more. The system uses an electronic tape to give the signals for starting and stopping the trains. *—Associated Press*

Computer Can 'Learn'

NEW YORK—Evidence has been found that modern electronic computers may be able to 'learn' from experience and get things done without being told exactly how.

Experiments suggest that an electric computer might exercise judgment, in addition to exceeding the human brain in quickness of thought or extent of memory. They have been conducted by a young Harvard Medical School student on the International Business Machines 704 data-processing machine.

The results of a series of preliminary experiments on this scientific computer by the student, R. M. Friedberg, will be published in the January issue of the IMB Journal of Research and Development. Friedberg is a medical student who has had some recognition as a mathematician. He is at Harvard now, and the experiments will be continued.

The point in the tests is put by Friedberg this way:

'If we are ever to make a machine that will speak, understand or translate human languages, solve mathematical problems with imagination, practice a profession or direct an organization, either we must reduce these activities to a science so exact that we can tell a machine precisely how to go about doing them or we must develop a machine that can do things without being told precisely how.'

It may be easier and quicker to make a machine that can 'learn,' than to reduce a profession or a language to an exact science, Friedberg suggested.

In Friedberg's tests, the IBM 704 computer exhibited evidence of 'judgment'—the ability to form habits, to learn, to solve problems easier after practice, to retain the benefits of experience.

Such evidence came from a series of experiments in which a computer called Herman (the letters stand for nothing) was connected to an element called Teacher. Teacher examined Herman's memory at frequent intervals to see whether a desired task had been performed successfully. A third element, Learner, took Teacher's announcements

of success or failure and evaluated these in comparison with the instructions that Herman had followed.

All three elements — Herman, Teacher and Learner — were simulated by the 704 data-processing machine. Normally, a highly skilled mathematician sets up in such a computer a program that he knows will accomplish a particular end; the computer then relieves the mathematician of tedious calculations.

In the Herman-Teacher-Learner experiment, a 'universe' of programs was provided. The universe consisted of all known programs for solving a problem on the 704 computer. This included some 'senseless' programs as well as all the 'methods that ingenuity might discover.'

The experiment was conducted to find out whether Herman-Teacher-Learner would have to go through an astronomical number of programs or whether the machine had some judgment. The computer was found to be able to 'learn' from experience.

Herman did the work. Teacher studied the wrong answers that Herman came up with and told Learner that Herman was wrong. Learner modified Herman's activities until Teacher was satisfied.

In an early test, Herman got the right answer about as many times as chance would allow. But suddenly Herman 'hit the jackpot,' Friedberg reported. Thereafter Herman was always right.

The problem was changed slightly, and then drastically. The computer retained a better-than-chance ability to come up with the right answers. **—New York Times**

Solar Energy for Heat

DENVER — Dr. George Lof's big new 'house of the future' here costs him very little for fuel, despite an unusually cool and cloudy rocky-mountain autumn. The reason? Dr. Lof's nine-room house, with 2000 square feet of floor space, is the largest solar-heated building in the U.S.

Dr. Lof, a consulting chemical engineer and a former university professor with 20 years' experience in the solar field, is one of the pioneers who looks beyond the era of conventional coal, oil, and even uranium fuels to the day when a crowded earth will make direct use of sunlight for energy.

The best thing about solar energy, Dr. Lof and other solar scientists point out, is that it is free—and nearly unlimited. Every second of the day the sun casts on the earth the energy equivalent of 300 trillion kilowatts of energy. All man has to do is learn how to harness it.

Dr. Lof has succeeded on a rather impressive scale. He has rigged up three 'heat traps' on the flat roof of his home and has inclined each of them at a 45 degree angle so that they catch the greatest amount of sunshine throughout the year.

Each of the 'traps' is six feet wide by 50 feet long, aggregating an area of 900 square feet of collecting surface. The bottom of each 'trap' is blackened while across the top are three layers of clear glass.

The devices duplicate the well-known 'greenhouse effect': short-wave solar energy penetrates freely through the clear glass. When it heats the blackened surface it is changed into long wave-form. Since glass is resistant to long-wave solar energy, the heat is retained within the 'trap.'

Dr. Lof's collectors heat the enclosed air up to 300 degrees on a sunny day, even in winter. The hot air is pushed by a blower system into the house heating unit and around the hot-water tank.

Surplus heat is funneled into heat-storage tanks. Dr. Lof's tanks consist of two tall insulated columns three feet in diameter and filled with egg-sized gravel. Rock, according to Dr. Lof, is the most efficient heat-storage material.

After ascending through the storage tanks, the air emerges cool and re-enters the heat trap on the roof, ready to collect another load of solar energy and repeat the cycle. Dr. Lof believes that his solar 'traps' will save him two-thirds of the money he would have spent on conventional fuel this year. **—Associated Press**

Mechanized Clam Digger

THE TREND towards automation has now reached the clam flats of the Maritime provinces. A mechanized clam digger has been developed which may eventually eliminate, or reduce to a large extent, the back-breaking work which has been the traditional lot of the clam digger.

However, labor saving is not the reason for developing the mechanized digger. Hand digging has been shown to be very destructive of young clams on the beach and it is hoped that the power digger will reduce destruction and allow culture methods.

So far only one such machine has been built in Canada. It was made for the federal Department of Fisheries by the staff of the Atlantic Biological Station of the Fisheries Research Board of Canada at St. Andrews, N.B. The director of the station, Dr. J. L. Hart, reported on its performance at the Research Board's annual meeting in Ottawa.

Results so far have been encouraging. In tests at Clam Harbor in Halifax County, Nova Scotia, it harvested clams to a depth of 14 inches from 1200 square feet of bottom in one hour. It is 90% efficient in harvesting small clams from half an inch to an inch long from the upper six inches of soil and 50% efficient in taking larger sizes.

In its present form the digger can be useful on high flats where there are plenty of young clams but where growing conditions are poor. The young clams can be transplanted to better growing areas. Last summer over three-quarters of a million young clams were harvested and transplanted to beds where they can be studied so that the advantage of transplantation can be measured.

The mechanical digger is a scoop equipped in front with water jets. It is pushed through the soil by a shallow-draft boat. Clams loosened from the bottom by the jets enter the scoop and are carried up to the boat by an endless belt conveyor. The St. Andrews station is continuing its experiments, modifying the design of the digger to improve its efficiency in taking larger clams.

—Department of Fisheries Information Services

Through the Technoscope . . .

Technocracy examines the various scientific and technological trends ***in North America today which point to the necessity for a new social mechanism that will provide security and abundance, with a minimum of working hours, to every citizen on this Continent.***

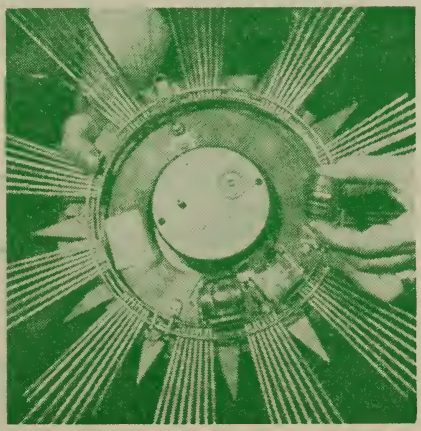
A NEW AUTOMATIC MACHINE built for General Electric Co. packages flashlight bulbs faster than you can rip the package open. It automatically forms plastic bubbles and encases a tiny bulb in each—at the rate of five per second—seals a strip of 10 bubbles onto a display card, and even perforates the separation between bubbles so the customer can easily remove a single bulb at a time.

A ROTATING SCALE THAT WEIGHS flaky or granular dry bulk material as it flows through a conveyor system has been developed by Stephens - Adamson Manufacturing Co., Aurora, Ill. The weighing device receives the material on one side of a rotating table, dumps it off the other side, determining the weight by measuring the offset force on the axle of the table. The scale indicates material flow rate in pounds per hour or tons per hour, or can be hooked up to a chart recorder for a record of total accumulated flow.

TRANSISTORIZED POWER PACKS to deliver high frequency current to fluorescent lights have been developed by Westinghouse Electric Corp. Running fluorescent lights on high frequency increases brightness and cuts power loss and ballast (transformer) size. Westinghouse's new units weigh only 11 pounds.

AN AIRBORNE COMPUTER THAT fits in the nose of jet aircraft and makes all the decisions necessary for flying, navigation, and the detection of enemy planes is being produced by Hughes Aircraft Co., Culver City, Calif. The computer is expected to relieve pilots of making routine flying decisions and so permit them to concentrate on tactical maneuvers.

A CORDLESS ELECTRIC CLOCK that gets its power from mercury cells has been placed on the market by Sessions Clock Division of Alliance Manufacturing Co., Alliance, Ohio. That means you can hang the clock anywhere without worrying about an electrical outlet.



X-RAY EYES WILL AUTOMATICALly control the thickness of the sheet steel coming from Jones & Laughlin Steel Corp's new $10,000,000 cold reduction sheet mill at Cleveland. Driven by 10 electric motors with a total of 23,000 hp., the new mill is one of the most powerful of its type ever built. It can handle 72-inch wide coils weighing up to 60,000 pounds at a speed of 3800 feet per minute.

AN ELECTRONIC WATCHMAN that detects danger, dials the telephone, and tells the person who answers where the trouble is, has been developed by Automatic Electric Co., Northlake, Illinois. Whenever a primary detecting device that closes a circuit, such as a thermostat, water gauge, or burglar alarm indicates trouble, the Electronic Sentry dials a present number and speaks a pre-recorded warning.

COST OF TITANIUM ENGINE parts can be cut as much as 40% by extruding them directly from cast ingots rather than from forged billets, using a technique developed by Curtiss-Wright Corp. for the U.S. Air Force. The process cuts scrap losses at least in half; the rest of the saving comes from elimination of the forged billets, which cost twice as much as ingots.

A RADIO TELESCOPE AMPLIFIER that will extend the range of radio telescopes ten times has been developed by the Gordon McKay Laboratory of Applied Science at Harvard University. Man may now be able to hear radiation from hydrogen clouds in galaxies beyond the range of present instruments and also to detect signals only 1/1000th as strong as now possible.

AN AUTOMATIC LIGHT ADJUSTER that dims or brightens lights according to the amount of natural illumination from the outdoors has been developed by Minneapolis-Honeywell. The device is a phototube mounted outside the building next to the windows of the area to be controlled. As the natural light changes, the phototube activates a device to raise or lower the level of the artificial light inside.

ULTRASONIC TOOTH CLEANING is made possible by a new dentist's instrument developed by Cavitron Equipment Corp., Long Island City, N.Y. The tip of the instrument is held against the teeth as it vibrates 1½ thousandths of an inch, 26,000 times a second. This oscillation loosens tartar, nicotine, and other stains, and a thin stream of lukewarm water washes the deposits off the teeth.

★ TORONTO—The bankruptcy office at Osgoode Hall has reported that there were more than 700 bankruptcies in Ontario during 1957, more than in 1933, one of the low years of the depression.

The office revealed that there was also one of the sharpest increases since the depression. In 1956 there were 534 bankruptcies while so far 700 have been reported for 1957. *—British United Press*

(*Continued from page* 20)

already installed. The resulting increase in factory productive capacity necessitated improved freightage for raw materials and finished products, a need further enhanced by the westward migration of pioneers. Railroads were stretched from coast to coast. Communications then became a problem, so in due course the telegraph took over the job of the greatly dramatized pony express rider.

The ensuing near-century which brings us down to our own times saw more scientific progress than occurred in all previously recorded history. Many people now living remember the first automobiles to appear on North American streets. Whatever needs prompted its invention are not nearly as important now as those it created. It soon became evident that the 'horseless buggy' needed a much smoother course of travel than the dirt roads to which old Dobbin was accustomed. The additional need for a road that was neither impenetrably dusty nor impassably muddy according to the vagaries of weather indicated hard-surfacing as the sole answer. The violent protestations of taxpayers and legislators alike at the great expense involved had eventually to yield before the rapidly increasing physical demand for hard-surfaced roads, though at first most such construction was restricted to urban areas. A few miles out in the country the roads remained bad for a long while. Even as recently as the mid 1920's it was still a considerable adventure to undertake a cross-Continent trip by automobile.

Only the hammering insistence of the magnifying traffic problem obliged positive action to be taken. A piecemeal building of a webwork of road systems followed, making transcontinental travel relatively simple in the ensuing years. It seemed on the surface that the problem was solved, for traffic during the Great Depression and the Second World War was not sufficiently heavy to oblige future highway planning. Now we are paying the penalty. The traffic situation evolving since 1945 is one of so great seriousness in death, injury and wreckage that only a unified Continental control is capable of working out a solution. The transportation problem—vehicles and

thoroughfares — must be treated as unity. As yet the approach is still sadly myopic.

This failure to anticipate future needs is a characteristic born of the Price System's origin in an era of natural scarcity and hand-tool operation. There was then no great urgency to plan ahead very far since raw materials and customers were both fairly close at hand. The situation changed vastly as industry moved from the home to the guildhall, and thence to the mechanized factory. Modern industry is obliged to plan some distance ahead, but it does so only to the extent that such planning benefits its immediate bank account. This is a far cry from the magnitude of planning required by the overall social mechanism which is Continental in scope irrespective of the many arbitrary local and national boundary lines drawn indiscriminately here and there.

Individual outfits have short-range planned their needs, pooling their resources only when common necessity compelled them to do so. Today's integrated mechanism, then, has grown out of an accumulation of such short-range plans overlapping each other like shingles on a roof. This procedure which managed to bring us to our present stage of development at a terrible cost in wasted resources must soon be superseded by long-range Continental planning.

This scale of planning is demonstrated fairly well by the Continent-wide service provided by the Bell Telephone Company. While the firm is essentially a Price System outfit and as such must subscribe to the usual financial motivations which have placed numerous stumbling blocks in the way of communications progress, the very nature of its service has demanded a greater degree of planning than is common to most 'free enterprise' concerns.

The company's center of technical progress is the Bell Telephone laboratory which Technocracy Inc. has previously held exemplary of the type of functional administration required on a much larger scale by all Continental operations. A striking feature of telephone service is that it is not for sale. You do not own the telephone set in your home or place of business. You merely rent it. It became obvious very early that in order to accomplish

its work effectively the company must own and control all of its equipment. This decision originated out of research which disclosed it as a functional requirement.

At first, telephone communication was possible only over single wires directly joining two different receiving sets. Before long the rapid growth of the medium's popularity demanded something less cumbersome. Switchboards provided the answer. In major cities the telephone lines soon presented a grave difficulty. Even unsightly poles carrying fifteen or more crossbars with ten wires on each proved incapable of carrying the increasing load. The solution was found in cables of about two-inch diameter which possessed greater potentiality for calls each than was ever possible in the former bulky setup. Moreover, the cables could be placed underground in easily accessible conduits.

Between the two World Wars expanding subscriptions rendered manual exchanges inadequate, but the directorship shied from installing the automatic dial exchanges which the research staff already knew to be the next step in telephone communication and for which they had already designed equipment. Too expensive! The Depression '30's saw some conversion when dial exchanges were proved cheaper to operate than manuals, but it took the severe pressure thrown on existing facilities by World War II to show conclusively that funds must be appropriated for a complete changeover to automatic exchanges. Otherwise it would take all women over 18 years old to operate the overloaded manual systems. This physical necessity alone accounts for the present extensive conversion program which will ultimately make cross-Continent telephoning as simple as cross-city.

Making money and giving service are opposite motivations which, as in the foregoing instance, inevitably clash. They are but symptoms in a basic struggle between distinct Price System necessities on the one hand and those of an advanced technology on the other. Odds in the mammoth struggle, soon to be resolved, are all in favor of technology and science which have brought a still-increasing, crush-

ing pressure against the antiquated Price System.

Some vital necessities for Price System perpetuation are: (1) natural or artificially-created scarcity; (2) built-in product inferiority to assure frequent replacement; and (3) flashy but useless gadgetry to attract quick sales. The reader can probably add a few more, but these are the principal well-documented defensive weapons. Their employment has resulted in some of the wildest schemes ever to confound the imagination of man — none of which have accomplished more than to delay the obvious outcome. One well-known tactic has been to employ scientists and technologists to direct their specialized training into channels that were socially useless or harmful but financially advantageous to the company or government concerned. This designed misdirection of science served its purpose temporarily but now is backfiring extensively in the manner which long-range planning would have disclosed as the only logical consequence.

Long-range planning is essential for the continued development of North American society. The physical equipment has become too massive and complex to do without it much longer despite all the well-known devices of wastage and destruction thus far used to offset abundance. So interdependent are all phases of installed technology now that nothing can be done in any single field without taking into account its effect in other fields. Accordingly, nothing less than a plan which takes all Continental needs into primary consideration and works from there down to the minutiae of individual requirements is sufficient. Since scientists, technologists and engineers designed the equipment in the first place and are fully familiar with it, they are obviously the most competent to administer its overall functioning and to anticipate future needs. They alone, unfettered by monetary or political restrictions, can direct the way for all North Americans to their destiny of unparallelled abundance in the world's most richly endowed land area. This, however, is but the desirable result accruing from the installation of that functional governance the need of which has grown steadily with every technological advance.

Pressure is mounting from all sides. Internally, our Price System is beset by an increasing abundance of consumer goods which refuse to keep hidden; by mounting consumer credit and, recently, mounting unemployment; and, consequently, by a growing public concern over the questionable stability of the entire economy. Externally, it is becoming evident that other global powers are overtaking us in several fields. We are behind in the guided missiles field. We have been subjected to embarrassing ridicule as the result of the satellite fiasco. We have lagged dangerously in the training of scientists and allied functional personnel. Other nations are gaining in the international race for markets because they are manufacturing superior products. Such shortcomings are as dangerous to a national economy as they would be to that of a company which failed to keep abreast of all industrial developments. The effect, though, would be of devastating proportions because of the corresponding difference in magnitude.

Difficulties of this nature could never beset a Technocratic governance. The absence of monetary problems would assist immeasurably in long-range planning to produce a living standard that no other land area in the world could approach. Among numerous other projects would be—all on a Continental scale—a comprehensive educational system to provide all foreseeable personnel requirements; an integrated transportation system; and a hydrology system which would not only provide economical water transportation, but would effect beneficial climatic changes and raise dangerously low water tables in various parts of the Continent. Today such massive projects could not be financed even if their need were recognized and plans for them agreed upon by all political administrations affected — itself an unlikely hope.

The Technical Alliance, forerunner of the present Technocracy Inc., recognized the probability of the need for functional governance forty years ago. The data compiled by this group of scientists, engineers and economists—all prominent men in their respective fields—showed that a turning point had been reached in North American industrial history. Until the United States

entered the First World War it had still been necessary to employ more men to produce more goods, but the induction of men into the armed services plus the resulting manpower shortage at home to produce munitions and supplies necessitated a suddenly demanded increase for technology to take up the slack. What happened? From that time onward, in order to produce more goods, **less** manpower would be required. The Technical Alliance personnel understood the implications of this situation as no one else seemed to; so on the basis of all their findings and without any preconceived ideas of what course should be followed, they formulated the social blueprint of functional governance now known as Technocracy. The Organization of Technocracy Inc. which grew out of the need to promote this program has been doing exactly that for a quarter century.

It is not the present intention to explain the particulars of the Technocracy blueprint. If the reader is impressed with the necessity of instituting a functional governance which is in accord with our stage of technological progress he will want much more information than is possible to give here. He may obtain it by purchasing further literature or by contacting a member or headquarters of the Organization. He may attend a Study Class, Current Events Classes and other activities to keep him abreast of the trends pointing the way to social change. If he is a citizen of some North American country and not a member of a political party he may apply for membership in the non-political, non-partisan, educational-research Organization. This would be the most positive way of showing his understanding of the need for science in the social field. Then, as an informed North American, he may promote the program to other citizens who are concerned about their future and invite them to make similar investigations.

Technocracy is the only answer to the North American dilemma. Necessity demands its installation as vital to the welfare of all residents.

★ LONDON—The work week at a Russian metallurgical factory in the Republic of Uzbekistan has been reduced to 34 hours, without any cut in pay, the Soviet news agency Tass reports. *—Reuters*

The Challenge of Soviet Science

A radio talk delivered over the Trans-Canada network on October 25 by Dr. Cyril Reid, who had recently returned from a scientific conference in the Soviet Union. Dr. Reid has been a professor in the chemistry department of the University of British Columbia since 1948.

THE RUSSIANS have now the first satellite, the Intercontinental Ballistic Missile, the highest energy nuclear accelerator, at least one working nuclear power station, and the only regularly scheduled jet airplane service in the world.

We however are well ahead in the size of our TV screens, the length and number of our automobiles, the beauty and efficiency of our washing machines and mixmasters and so forth.

These facts should be sufficient to convince us that in the new technology, as it concerns nuclear and governmental power, we are losing the race.

Ever since 1945, western scientists have tried unsuccessfully to convince people in general and American senators in particular, that technological superiority is not a God-given quality. With the appearance of Sputnik it seemed that they might be convinced, but in the last week or two, lulled by the bland words of Mr. Eisenhower and others, there has been a drift back to the attitude that free enterprise is infallible, and therefore all will be well.

My experiences in the U.S.S.R. have convinced me that this is not so. I was fortunate in meeting dozens of chemists, physicists and biologists ranging from the President of the Academy of Sciences down to students of the Moscow University and in seeing a dozen or more Scientific Institutes. Not only are the Russians producing more scientists and engineers than the West by a considerable margin, but their average calibre, training, motivation and equipment are also often superior to our own. The productive scientists are being wisely used in the sense that they are freed as far as possible from financial and administrational problems, ideas being the products demanded of them. The Academy of Sciences which provides the top level plan-

ning of much of Soviet science has tremendous prestige and wide powers. So much so that 'Akademia Nauk' became our password in Russia and opened all doors to us. How did this situation arise?

The full force of Soviet propaganda has been aimed to create respect for knowledge, and veneration of the past and present leaders in creative thought as a result of Lenin's insistence on the importance of education. Education is free—University students are all paid — but only those whose record shows ability and hard work get higher education. The University of Moscow takes only one tenth of its applicants. Aside from the political elite, scientists and teachers have the highest status in Soviet society. Wage differentials are very great. A good scientist earns fifty times as much as an unskilled worker. In our society he may earn 4-5 times as much as unskilled help, but an enterprising plumber or carpenter may actually make more than the scientist.

In the West, we have reached the stage at which billions of new dollars poured into research cannot be very effective because there are literally not enough good scientists to use them. By and large, our young people are not interested, and have already made their choice against science in the high schools. Here the proportion of students studying mathematics, physics and chemistry has fallen steadily for the last fifty years as a result of courses which I label 'Ineffective Living.' These teach a child how to live happily without achieving anything and how to be self-confident with no good reason for being. This may be valuable in a society which is playing, but the Russians are in earnest. Their propaganda system — films, radio and television constantly remind them of the horrors and brutalities of the German invasion, and they are taught to think of Americans as the same kind of animal. They will remain for a long time earnest about creating a technologically superior society to that of the West.

Meanwhile, most of our 'smart' children think that science is something for screwballs who haven't enough personality to make money the easy way. The rest find it difficult and uninteresting because of inadequate teaching. And the shortage of

good science teachers will get much worse unless something drastic is done. We do little to convince our children that Academic success is more worthwhile than success at football, and that the team work required in modern science can also be fun. The picture of the scientist as a long haired and eccentric individual, working alone in uncomfortable surroundings, is still widespread though false.

This lack of enough of the right kind of people is the main deterrent to rapid expansion of our scientific effort. There are other difficulties, however.

In the vital areas of rocket and reactor, for instance, there is much duplication of effort and much withholding of valuable information because of the competitive aspects of our economy. These enormous projects are too costly in terms of our best manpower for the competitive rather than the cooperative approach.

And finally, Russian science is organized to take full advantage of science in the West, while we work almost in ignorance of what the Russians are doing. I am speaking not of espionage systems, which are of course a factor, but of available, published work. Few of our scientists read Russian, and the circulation of translated material is still woefully inadequate. By contrast, almost every Russian scientist reads English and German easily, and they have in addition an enormous array of translators and interpreters.

These are the facts. What can we do about them? The enthusiasm of Russian youth for knowledge and hard work is also not God-given. It results purely and simply from the power of advertising and is as inevitable as the fact that we buy the soap that prevents B.O., or the cream that makes us young again. We currently spend more on advertising than on education and believe that advertising will sell anything. Advertising the joy and importance of knowledge, together with good salaries for our teachers and scientists and real rewards for the young people entering these exacting professions, even when they are students, could start the change today. For instance, the top 10% of our university students could be supported at the cost of about 15% of one army division.

In the face of our addiction to a soft and comfortable way of life, nothing less than strong government initiative, and the co-operation of every thinking individual, can change the pattern quickly enough. Most of us are self-seeking and narrow in our outlook only because our society encourages this attitude. When a real appeal is made for s e r v i c e to society, as in times of war, such service is given willingly and enthusiastically. The hemisphere is now in greater danger of defeat than it has ever been in time of war.

Too often, alas, our ministers of education and our leaders in politics and business themselves have no taste for science, and do not relish the thought of a world in which science is of ever increasing importance. But we are not free to choose any other path in the f a c e of the Communist challenge. So instead of unwilling slaves to science, we must create an a t m o s p h e r e in which our people can enjoy the adventure of science a n d respond to this challenge. This means recognizing that Education has No. 1 priority and encouraging our most able minds into that area, by immediate increase in prestige and salaries and by advertising and emphasizing this importance through all the mass media.

In the interest of our ultimate freedom we must accept more responsible government planning of the proper use of our technical resources.

If we do not act now, our society will within ten to fifteen years be technologically second rate. Under such conditions, even if wars can be averted, it would be foolish to assume that our system could be preserved. There is no doubt that if the West had the power to r u i n the Communist world by e c o n o m i c means it would be rather happy to do so. There is still less doubt—since it it their professed aim— that the Communists will do the same to us if they have the chance.

So our society will change. If we act now, we ourselves may change it fairly painlessly, in the light of the c h a n g i n g world around us, preserving the respect for human l i f e and individual human aspirations w h i c h in a stern history of war and oppression have never had a chance to grow in the U.S.S.R.

If we do not act it will soon be too late. A change will be imposed on us from outside, and it seems very likely, looking at the precedents, that many will suffer misery, and perhaps death in the process.

I am by no means a voice in the wilderness when I say we must change to survive. Almost every responsible scientist I have talked to recognizes the same facts. Since the end of World War II the Russians have for the first time seriously challenged western society. Are we to lose by default, unable, although we see the dangers, to overcome the inertia of a society so complacent as to believe that its place in the sun is assured forever—with no effort involved? **—Dr. Cyril Read**

★ TODAY, MACHINE POWER and the use of oil, coal, electricity and other inanimate sources of energy (including the atom) have taken over practically our entire work load. It is no accident that the United States leads the world in per person use of inanimate energy, as it does in per person income.

In 1850 more than one-eighth of all our work was done by human beings and more than one-half by horses, mules and oxen. Muscle power of animals and humans thus accounted for slightly less than two-thirds of the work; and inanimate sources (steam, wind power, falling water, etc.) for a little more than a third. By 1900 the work-animal share had dropped to 22% of the total and that of human workers to 5%. Today, muscle power of either animals or humans has been all but eliminated; and nearly 99 per cent of the total useful work-energy of the country comes from machines. *—Twentieth Century Fund Report*

★ THIEF RIVER FALLS, Minn.—Sen. Hubert H. Humphrey, Democrat from Minnesota, said here 'what we need in Washington are more eggheads and fewer fatheads' to meet the Soviet missile challenge.

Humphrey said the U.S. is now in a 'one-game world series' with Russia and 'we cannot afford to lose any more innings.'

He told Minnesota student council leaders: 'It was Soviet "eggheads" who got the Sputnik off the ground, and it will be American eggheads who will get our nation off the ground—if we but give them the support they need.'

He said a series of bills he has introduced providing federally-subsidized scholarships would 'encourage a radical increase in the output of American scientists, engineers and other professionally trained workers.' *—International News Service*

★ AMSTERDAM—'The secretary who is merely adept at shorthand and typing will soon be obsolete,' Dr. Jan Loolan told a stenographic experts meeting here.

Dr. Loolan is working on an 'electrical secretary' that will be ready for mass production within three years.

'The machine will silently, obediently and efficiently take a letter, type it and address the envelope without stopping to powder its nose, light a cigarette or go out for a cup of coffee,' he claimed. *—Reuters*

Freedom Is Slavery

A Dissertation on Western Propaganda as it pertains to Freedom versus Slavery. By condensing the double-talk which is being mouthed by our so-called leaders, we are easily able to prove that Black is White and Liberty is Tyranny.

THE PEOPLE of the Western World are said to be free while the people of the Eastern World are said to be slaves. The distinctions between the two may not be as bold as the difference in names would imply; but there is a fundamental difference that must not be ignored. We of the Western World are free of communist domination while the people of the East are not. This difference should be given precedence over such trivial arguments as the one, for example, that the East has no overt slavery while certain countries of the West do have, or that certain Western countries still condone white slavery (if one is not too fussy about the use of the word 'white'). In our context, the word 'slavery' has a deeper meaning than merely its application to bodily servitude.

A free people are able to purchase goods of their own selection. They may vote for their own rulers from among opposing candidates. They may buy and sell merchandise in the marketplace. They may worship a God of their own choosing, according to their faith. Slavery is the opposite of freedom in all these respects. This is the basic principle of freedom; although, actually, freedom is more subtle than this. There are few places, even in the Free World, where all the characteristics of an ideal freedom prevail in their highest form, but that is a minor matter; for, there is an abiding belief in freedom and a yearning for it—freedom prevails in men's hearts.

If one does not have the money to buy things of his own choice in the Free World, and is thereby restricted to the cheapest of the utility items, one still has the freedom to choose the things he would buy if he had money. If the choice of political candidates is sometimes merely a matter of choosing between two hand-

picked individuals who represent the same interests, one is at least exercising the r i g h t of choice. (Where one is living under a hereditary monarchy or under a strong-arm dictatorship, one's political freedom is still more subtle; anyway, one isn't living under communism.) The right to trade in the marketplace may not appear to be much of a right if you are lacking merchandise to trade, or if the market is dominated by monopolies, or if you c a n n o t obtain, or afford, a franchise; but you are able to console yourself with the knowledge that if you could have been fortunate enough to be in a position of advantage, you could buy and sell in the marketplace.

In a slave society, the state decides what kinds of goods shall be produced and you have to accept them. The Party selects the rulers and you merely confirm them. You may purchase goods in the markets, but only the state can sell them. The state tells you whether or not you can worship God and, if so, which God to worship, when, and how. Of course some of the countries of the West insist that you worship the official God and that you observe the Sabbath and The Law; but, at least, none of them glorify atheism.

It is readily apparent to anyone that people living in a free society are m o r e capable than people living in a slave society. They think freely and produce willingly. The people of a slave state are not allowed to think and they work reluctantly. They can see nothing a h e a d for themselves. However, their masters are able to crack the whip over them and force them to do their utmost against their wills. The rulers can f o r c e the scientists and technicians to produce results or lose their heads. They can force their students to l e a r n quickly, and make athletes perform like champions. Because they can do this, it sometimes appears as though a slave society is more productive and efficient than a free society, which relies on incentive rather than on fear and compulsion.

Since the slave states of the East are able to make the people work hard for long hours for very little reward, and can make them go without the good things of life, they are more able to concentrate on weapons of war than are the free countries of the West. Even

though their war budgets are not as large as ours, they can produce more because of the low wages and because they do not have to pay profits to free enterprise business.

Another thing, when someone in the East shows unusual intelligence or ability, he is subsidized by the state and given every facility he can use and told to go to work. In that way, the slave states extract the utmost of achievement from their geniuses. We don't enslave our geniuses; we try to have them live like ordinary people should live in a free society. We don't want the neighbors to think they are 'different' from other people; so, we try to get them interested in things like making money and discourage them from thinking radical thoughts, which only cause trouble anyway.

The slave countries seem determined to become as militarily strong as we are, if not more so. It seems that they feel their way of life is in danger from aggression by the West. That, of course, is ridiculous, for we are peace-loving people. We wouldn't invade any foreign country, except in self-defense or in defense of some other free people, like South Korea, Greece, Turkey, or Pakistan.

Because the slave countries can concentrate their efforts on certain things more than we can, even though they do it at the expense of human values, they are a threat and a hazard to us. We cannot allow them to dominate the resources and the trade of the world. In order to preserve freedom and human values, we must maintain a more powerful military position than the slave countries. We must be ready to inflict massive retaliation on the provocation.

In order to do this, we may have to institute a 'crash program' of preparedness. We may have to forego some of the finer things of life and concentrate on defense. Our workers and scientists may have to be conscripted and put on overtime. Our businessmen may have to ge given greater incentives. We may have to restrict the amount and variety of consumer goods available on the market. We may have to work on the Sabbath as well as on the other days and turn our churches into child care centers so the mothers can also contribute their

efforts. We may have to suspend politics-as-usual and place our destiny under the management of some strong man, who can get action and more action. We may have to carefully guard our scientists so that none of them will try to slip secret information to the enemy. We may have to eradicate all subversives, traitors, and other 'dangerous elements' from our free society.

We must let the world know that we are a free people and that we intend to remain free!

—Jess Ewitt

★ WASHINGTON—A radio receiver that uses neither house current nor batteries has been operating day and night, without interruption, for two years in a government laboratory here.

It has required no service, and the only adjustment has been to change stations or reduce the volume when someone wanted less noise.

The inventor is Lloyd R. Crump, an electronics specialist engaged in transistor and tube research at the army's diamond ordnance fuse laboratories.

Crump's radio uses transistors, tiny substitutes for radio tubes. A radio tube requires current to heat its filament but the transistor has no filament.

The only power Crump needs is what he takes from the atmosphere in broadcast or telecast signals. This is sufficient to bring in programs on earphones and, near cities, on loud speakers.

The radio frequency energy from the air is stored in condensers that serve as storage batteries, but no perceptible time is needed to build up the charge.

In the battery-less receiver the power is taken from a television signal and the set is tuned to any of half a dozen standard broadcast stations. Sets can be built that will take power and sound from the same station. *—New York Times*

★ UPPINGHAM, England—Prince Philip told the boys of Uppingham School they'd better learn something about science if they want to get along in the new space age.

'Everybody has got to understand a little about science or he can't understand what the hell goes on around him in the world,' he said.

'Fifty years ago it didn't matter whether the majority of citizens knew a damn thing about science because they were taken about by horses. They had gas lamps which functioned more or less, and everything just happened naturally.

'Now you will find that unless you know at least something about science you won't get into the House of Commons.'

The remark brought a roar of laughter from the assembled youngsters who had just watched Philip open a new school building housing scientific laboratories. Philip said all schoolboys should get a scientific background, whatever profession they aspire to.

'It's quite ridiculous to assume that because you twiddle about with test tubes you shouldn't know about painting, or be able to appreciate music or history.'

—Associated Press

Economics of Automation

A review of two recent books on automation : AUTOMATION — ITS PURPOSE AND FUTURE, *by Magnus Pyke, published by the Philosophical Library, and* THE ECONOMIC CONSEQUENCES OF AUTOMATION, *by Paul Einzig, published by W. W. Norton and Co.*

THE RAPID development of electronic computers has spawned a number of exotic children, including Operations Research, Linear Programming and Automation. The first two, which actually are old techniques wearing new names, have been embraced by literary-minded professional economists. Automation however, which really is something new, and which is accompanied by a host of problems peculiarly within the province of economic science, has been left largely to the engineers, managers, laborites and politicians. It is to the shame of American economists that these two excellent books, one by a chemist and the other by a financial expert, had to originate in Britain.

Both Pyke and Einzig define automation in its broadest sense; that is, as a technique plus a philosophy. Both foresee a second Industrial Revolution, comparable in its social effects to the first, wherein not only muscle power but routine brain power will be replaced. They agree that this revolution is inevitable and probably desirable from the overall viewpoint, but both fear some of its possible consequences. Because of the authors' differing interests and approaches, however, the two books complement rather than compete with each other.

Nine of Pyke's 13 chapters are devoted to present or potential applications of automation in specific industries or occupations. These include engineering, chemistry, the petroleum industry, accounting, transport, merchandising, food and catering, guided missiles and automatic language translation. The principal merits of this section of his work are the author's simplicity of style and his interpretative and historical insights. The least technical reader can follow his discussion with-

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out difficulty, and the most prosaic will find food for his imagination.

Pyke's major contributions, however, are in his introductory and concluding chapters. It is here that the pertinent human questions are raised. Will our way of thinking be adapted to the machine, or vice versa? Will the need for labor finally be overtaken by the labor-saving capacity of the new techniques? If so, what will be the impact of the Leisure State upon a people dedicated to the Gospel of Work? Will the impersonalism of automation be extended to social and political decision-making? Will society preserve a place for the non-conformist, or will we become a robotized ant colony? Needless to say, the author does not have definitive answers to these questions, but it is important that the questions be asked. One gathers the impression that Pyke hopes for the best but would not be too greatly surprised if something less than the best developed.

Einzig challenges the premise that the problems of automation can be solved by existing economic theory. Whether or not we need a new 'Automation Economics,' as he suggests, or only an application of present economic analysis to automation problems, is largely a matter of terminology. There is little dispute, however, that neither 'classical' nor 'Keynesian' economists have given sufficient attention to the potential problems of automation. To remedy this deficiency, the author devotes one or more chapters each to the probable effects of automation on employment, output, price levels, distribution of the product, capitalization, international trade and exchange, business cycles, monetary and fiscal policies, raw materials supplies, government intervention, wage policies, underdeveloped nations and national defense. Parenthetically, his analysis does not utilize a 'new' economics. In addition, several chapters deal with technological, commercial and social aspects of automation.

Einzig's basic position might be described as a safe middle-of-the-road one. He concludes that the dangers of automation are not great as claimed by its opponents, nor so small as maintained by its enthusiasts. The long-run advantages of the new technique far outweigh its admitted transitional

disadvantages. And even the short-run disadvantages may be minimized by prompt and correct action.

Einzig's optimism is less cautious than Pyke's. As examples, two of his possible 'answers' may be cited. Concerning the possible rapid exhaustion of irreplaceable raw materials because of a 'too-rapid increase in the standard of living resulting from automation,' he finds that 'Planning on national and international scale is the only answer to this problem.' Again, in discussing the sharing of the benefits of automation, he suggests 'some intelligent compromise in which all legitimate interests would be reconciled with each other and with the public interest.' This is likely to occur on the day when philosophers become kings and kings philosophers! Meantime, we still are faced with the short-run problems of adapting to automation.

—Roy J. Sampson

★ CHICAGO—Dr. Harold C. Urey, noted pioneer in nuclear chemistry, has stated that the United States is showing signs of decadence.

Urey, who won the Nobel prize for his discovery of heavy water, made these other points in an interview :

The missile program might not be lagging as it is if the government had not fired scientists J. Robert Oppenheimer and Edward U. Condon as security risks.

The American people need a 'blood, sweat and tears' lecture by a top government leader, but will get 'nothing more than soothing syrup' from President Eisenhower.

Urey said 'tail fins and big, gaudy cars' are signs of American decadence. 'These over-powered gas-eaters are an idiotic waste,' he said.

'Some day we'll wake up in a serious conflict with our "left-handed friend" behind the Iron Curtain and we won't be able to get oil out of the Middle East.

'Maybe then we'll regret the waste of our resources on useless horsepower.

'And just think of the money, materials and engineering talent that go into retooling for model changes to make last year's car obsolete and hasten it to the junk pile.' *—British United Press*

★ LONDON—Russia has claimed to have the world's more powerful radiotelescope and to be working on another 50 times more powerful.

The Soviet news agency Tass has quoted Dr. Semyon Khaikin, Russian physicist and mathematician, as saying that the new telescope is 130 metres (about 426 feet) long and that the area of its reflecting bowl is 400 square metres (about 4300 square feet).

Dr. Khaikin told a radio astronomers' conference here that the telescope can receive radio signals of a wave length as short as three centimetres, or about 20 times shorter than those that can be received by the telescope at Jodrell Bank, England, reputed to be the largest in the world. *—Reuters*

TECHNOCRACY

NORTH AMERICA'S ONLY SOCIAL DYNAMIC

WHAT ?

★ Technocracy is the only North American social movement with a North American program which has become widespread on this Continent. It has no affiliation with any other organization, group or association either in North America or elsewhere.

★ The basic unit of Technocracy is the chartered Section consisting of a minimum of 50 members and running up to several hundred.

★ It is not a commercial organization or a political party; it has no financial subsidy or endowment and has no debts. Technocracy is supported entirely by the dues and donations of its own members. The widespread membership activities of Technocracy are performed voluntarily; no royalties, commissions or bonuses are paid, and only a small full-time staff receives subsistence allowances. The annual dues are $9.00 which are paid by the member to his local Section.

★ Members wear the chromium and vermilion insignia of Technocracy — the Monad, an ancient generic symbol signifying balance.

WHERE ?

★ There are units and members of Technocracy in almost every State in the U.S. and in all Provinces in Canada, and in addition there are members in Alaska, Hawaii, Panama, Puerto Rico and in numerous other places with the Armed Forces.

★ Members of Technocracy are glad to travel many miles to discuss Technocracy's Program with any interested people and Continental Headquarters will be pleased to inform any one of the location of the nearest Technocracy unit.

WHEN ?

★ Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers and economists that become known in 1920 as The Technical Alliance — a research organization. In 1933 it was incorporated under the laws of the State of New York as a non-profit, non-political, non-sectarian membership organization. In 1934, Howard Scott, Director - in - Chief, made his first Continental lecture tour which laid the foundations of the present nation - wide membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing.

WHO ?

★ Technocracy was built in North America by North Americans. It is composed of North American citizens of all walks of life. Technocracy's membership is a composite of all the occupations, economic levels, races and religions which make up this Continent. Membership is open only to North American citizens. Aliens and politicians are not eligible. (By politicians is meant those holding elective political office or active office in any political party.)

★ Doctor, lawyer, storekeeper, farmer, mechanic, teacher, preacher or housewife — as long as you are a patriotic North American — you are welcome in Technocracy.

TECHNOCRACY

Whatever the future of Technocracy, one must fairly say that it is the only program of social and economic reconstruction which is in complete intellectual and technical accord with the age in which we live.

—Encyclopedia Americana

TECHNOCRACY DIGEST

MAY '58

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Point of No Return

The Great Steel Strike

Automation Gets It Wholesale

Scientists Under Fire

Electronically Guided Automobile

The Tools of Society

Professor Predicts Five-Day Weekend

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THE ONLY MAGAZINE IN CANADA THAT IS PREPARING THE PEOPLE OF THIS COUNTRY FOR SOCIAL CHANGE.

MAY, 1958 No. 168

STAFF

DONALD BRUCE.....*Editor*
MILTON WILDFONG.....*Assistant Editor*
RUPERT N. URQUHART, *Assistant Editor*
ED BRODERICK.....*Assistant Editor*
JANE URQUHART....*Circulation Manager*
HELEN SLATER.....*Business Manager*

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A Permanent End to Depressions

In an area of highly developed technology, the oscillations of a free-playing Price System economy become disastrous. North America can no longer tolerate economic booms and depressions. They must be brought to an end, permanently.

IN THE DAYS of perennial scarcity, meaning any time and place prior to World War I, economic depressions were of minor magnitude and duration and they were more closely related to monetary factors than to physical factors. Since World War I, particularly on the North American Continent, the major emphasis has been on the physical factors, of which over-production is the principal one. In an area of highly developed technology, the oscillations of a free-playing economy become disastrous. North America can no longer tolerate economic booms and depressions. They must be brought to an end, permanently.

The United States government, although denying any direct responsibility for the economic operations of the country, has taken upon itself the guardianship of the Free Enterprise economy of the Western World. Moreover, the Eisenhower Administration has claimed credit for the erstwhile period of prosperity and has virtually promised the American people that Republican Uncle Sam would not tolerate another slide into a depression. This same Eisenhower Administration is now in an embarrassing position

—Shoemaker in Chicago "Daily News"

"DON'T WORRY, KID, YOU'LL BE O. K. SOON"

and is highly befuddled by the developing trends of the past year. The Democrats have no Prosperity formula either.

There are some amateurish gropings for an explanation of the cause of the 'recession.' And there is hope that it is merely a business adjustment; that as soon as inventories are brought into line with sales, there will be a return to full production and full employment with an accompanying economic upswing. This hypothesis was used as the basis for the president's making a prediction (or promise) that the recession would begin to end in March. That prediction has proved to be a 'floperoo.' There is also a naive attempt being made to blame the recession on lack of confidence among the consumers and investors. Yet, it is obvious that the consumers have already overcommitted their purchasing power and credit; and investment capital has already greatly overexpanded the production facilities of the country. How much confidence in the Free Enterprise system do they expect?

Of course, the government should not take a direct hand in operating the economy for the welfare of the people, so argue the journals and spokesmen of business enterprise; but, it would be nice for the government to reduce taxes, create more debt, and spend more money in order to give transfusions to the economy at public expense. The government could also permit a faster depreciation writeoff for industrial installations. Big business would even go one step further in its recommendations; it would like permission to write off depreciation on the basis of the estimated 'replacement cost' of the installations on hand rather than on the actual cost of their construction. So, it can be seen, there are many ways in which the government can operate to the benefit of business enterprise without taking direct charge of the economy.

Big business wants a reduction of taxes in the upper brackets; Labor wants a reduction in the lower income brackets. Labor's argument is that a reduction in taxes imposed on the lower income consumers would provide them with more purchasing power to buy more goods to stimulate more production to provide more wages and more profits. Big busi-

ness argues that a tax reduction in the upper income brackets would encourage more investors to invest money in expansion and production since they would then be able to retain more of the take for themselves, and this would provide more employment for more people and bring back prosperity. Both lines of argumentation are for simpletons.

For the past 16 or more years, every governmental move and political suggestion has had to be tied in with 'defence.' Unless a program or proposal could be justified in the name of 'defence' or 'security,' it had no chance of being considered seriously. The tune has changed slightly; now, everything must be justified on the basis that it will 'help' the economy. For illustration, up to this year all arguments in favor of foreign aid revolved around national defence and security; now the Dulles-Eisenhower speeches refer to the importance of foreign aid in helping the American economy. How giving things away would help the economy may be a little vague for the average citizen to comprehend; but it is a matter of simple logic for an economist or a politician. Much of the foreign aid consists, directly or indirectly, of American goods which, it is argued, mean profits for American business and employment for American Labor. The consumer merely gets soaked for the cost on a three-fold basis; that is, first, he is taxed to pay for the goods; second, he is taxed to pay the handling cost of giving the stuff away, which is considerable; and, third, he has to pay higher prices for the goods he buys as a result of the 'scarcity' created by the give-aways.

We must remember that American politicians will always deprive their own people of the good things of life in order to give them away to foreigners or to destroy them. Politicians operate on the theory that the scarcer things are the more valuable they are, hence the better off is the economy. American politicians of all parties can think in no other terms; to attempt to do so would be political suicide. It is all right for a President Truman or Eisenhower to proclaim that he is 'fighting inflation' just so long as he **does not** fight inflation; and his political fortunes are more assured if he actively promotes

inflation. That great 'friend' of the people, Franklin D. Roosevelt, gained a life-time tenure in office of president through fighting — not inflation, but — deflation. In other words he fought against abundance and cheap living for the consumers. And the sucker public loved him for it.

The Republican Administration is dusting off the old Herbert Hoover speeches of 1931 and 1932, which stated that the economy was essentially sound and vigorous but that it was undergoing a temporary normal healthy readjustment. All that was needed was confidence on the part of business and the public. Prosperity was just around the corner and the upturn would soon arrive. The politicians, the economists, and the financial editors have learned nothing about national economics over the past 30 years.

Prosperity under the Price System depends on an unbalanced economy; it is not possible of achievement with a balanced economy. Among the 'favorable' imbalances are the following:

Expansion of Debt. If debt is able to be expanded faster than it is paid off, then, it is possible to sell more goods to the consumers than would otherwise be possible. Also, merchants and speculators would expand their inventory and stock holdings and producers would be encouraged to expand or improve production facilities. Such creation of debt, however, can be gained only if there is adequate assurance that the debts will be paid off in the future. But, if the debts are paid off, the scheme defeats itself. There are two ways in which such debts can be validated, tentatively, without unfavorable consequences to the general economy: one, if enough new debt is created to more than compensate for the retired debt; two, if inflation destroys the value of the debt certificates.

Inflation. If there is a gradual inflation of prices and monetary values, the effect on the general economy is similar to an expansion of debt in that more monetary units are put into circulation. It results in greater bookkeeping profits, in more paper values, and in 'increased' take-home pay; and old obligations can be met more easily by the debtors. Hence, inflation tends to generate a feeling of confidence in the system and to stimulate econo-

mic activity. However, this is only temporary in its effects; for, soon, the psychological lag is overcome and people learn to think in terms of the inflated values. If the inflation is slow and steady, as in the United States, it might drag on for years; otherwise, it may reach a crisis very quickly. Eventually, if not sooner, the costs of living overtake the rise in wages and economic distress follows. This stage appears to have been reached in the United States.

Managed Economy. If the government or a monopolistic consortium or cartel of big business enterprises conspires to manipulate the 'laws' of supply and demand, a temporary prosperity can be conjured up. However, such prosperity usually applies mostly to the top economic groups, who need it least of all. For example, **price fixing** (as under 'fair trade') results in higher costs to the consumers but more profits to business enterprise. **Foreign aid,** another device for managing the economy, means that the economy must support the subsidization of exports so that big business corporations can reap greater profits and the consumers at home pay higher prices. Governmental aid to business, through fast depreciation writeoffs, 'defence' contracts, and other handouts, merely concentrates more wealth into the hands of the large holders of wealth and runs up the costs to the consumers; albeit in the process some of the 'aid' does filter down to the consumer level through wages and other operational costs. The New Deal attempted to operate more efficiently than most administrations in its management of the economy by redistributing considerable wealth and credit to the lowest income groups, although at the same time it poured billions in at the top. This technique infuriated those in the upper income brackets who much preferred the previous method of pouring **all** the redistributed wealth in at the top. The New Deal was able to do no more than stabilize the economic recession, however, until World War II came along and permitted debt creation by the hundreds of billions of dollars instead of only billions. In design and intent, the New Deal attempted to apply all the schemes which we have enumerated so far: debt creation, inflation, and managed economy.

Foreign Trade. Under certain circumstances, foreign trade tends to promote prosperity. Such trade requires that raw materials be acquired cheaply and that exported goods be sold dearly. If there is enough of this sort of trade, particularly if there is a home processing or manufacturing sequence in between the imported raw materials and the finished exports, there can be maintained a wealthy bourgeoisie and a subsistence consumer mass in the home country. The cost of this 'favorable' imbalance, however, must be borne by the 'colonies' which supply the cheap materials and buy the costly merchandise. There, mass poverty of the lowest order and long hours of toil must prevail. But from the nationalistic point of view, such matters affecting the colonies are irrelevant, incompetent, and immaterial. Lately, the 'colonial' areas which can be exploited by the imperial nations are rapidly diminishing. The Arabian oilfields and the mineral deposits of Africa are the chief sources of such prosperity today.

An imbalanced economy once could be operated on a small scale for long periods of time. But with present-day magnitudes, the duration is very much shortened. In order to create enough debt to maintain economic prosperity, it is now necessary to resort to extreme measures of stimulation, such as war—or at least preparations for an immediately 'threatening' war. In a technologically developed area, such as the United States, debt creation for mere internal development of the type that politicians can envisage is not sufficient. The New Deal discovered that debt creation for general relief and public works was insufficient to stimulate even a return to 'normalcy.' It required World War II and enforced public investment in War Bonds to build up enough debt for a prosperity.

Inflation is a one-way process which eventually reaches ridiculous proportions, as has been demonstrated by a number of nations over recent decades. Any reversal of inflation—deflation—works a hardship on the economy and results in a 'recession' or worse.

Since a managed economy is always designed to benefit the large holders of wealth and reduce the living standard of the great majority of the people, it is bound to get out of hand sooner

or later. The token gestures of the United States government to manage the economy to the advantage of the lower income groups fall far too short of any effective achievement. These gestures include a graduated income tax on individuals and corporations, social security, unemployment compensation, and subsidization of employment and relief under special emergencies. These attempts to redistribute the wealth are far too inadequate, for, most of that taken from the high income groups in the form of taxes is poured back into subsidization for big business, while most of the money paid out to the lower income groups has already been taken out of their earnings. And when the latter is distributed, it amounts to so much less than a regular earned income that it contributes to a depression rather than to prosperity. Foreign trade is rapidly ceasing to be a one-way advantage, which it would have to be if it were to contribute substantially to a favorably unbalanced economy. With the exception of America's piracy of the oil of the Middle East, the metals of Africa, and the minerals, oil, and other raw materials of Latin America, our foreign trade can be classed in the break-even or deficit categories.

The United States has reached the stage where the Cold War, involving an excessive military buildup and armaments handouts to half the world, is insufficient to stimulate prosperity any more. While some $36 billion a year was being poured into the economy by private enterprise expansion, along with the Cold War, a semblance of prosperity could be maintained. But economic expansion has reached the place where new expansion results in the retirement of much more plant than is added; for, the new plants are faster, more compact, and very much more efficient than the old plants; and they emphasize reduced labor costs.

Technocracy has followed the trends of the American economy for many years and has held to the conclusion that they would eventually spell 'finish' for the Price System. The varying vicissitudes of national and world events prevented a prediction of the exact date, but of the final outcome there was no question. For this, Technocrats were often called 'Prophets of Gloom' by

the press. Now it is the press that is giving forth with the gloom. In the meantime, Technocrats rejoiced at each $36 billion that went into new plant and equipment, for they knew it was technology, not human opinion or desire that would bring about the end of the Price System.

Although Technocrats are familiar with the trends and contingencies which cause distress and prosperity in the Price System, it is not their intent to do anything to bring about either its downfall or its recovery. We recognize that the Price System's internal characteristics are its most efficient disintegrators in a technological society. And Price System prosperity is far more harmful than beneficial to the human race. This would be so even if the system could be stabilized and maintained until the irreplaceable resources ran out.

There is no physical reason why a very high level of living and security could not be maintained in our area for an indefinite period. North America has the manpower, the technology, and the essential resources to provide abundance to all of its citizens—that is, under efficient technological management. The present fault lies with the economic system, not with the means of provision. All that is needed is a basic change in the social concepts—a change from scarcity values to physical measurements. Such a change is not as easily effected, however, as one might suppose. There are strong forces of resistance.

The forces of resistance can be classified into three forms, namely: tradition, inertia, and stubbornness. In other words, it is a matter of human consent rather than a matter of technical incapacity. The present economic system has a long tradition, dating back more than 3000 years. In a dynamic age, this tradition is a social interference. In the realm of technology, many major changes have been made in the ways of doing things in spite of the resistance imposed by tradition; for example, the change from the horse and carriage to the automobile as a means of family transportation. But in the realm of the 'humanities,' where opinion prevails over measurement, tradition dies very slowly and reluctantly.

People don't like to be bothered

with altering their ways and facilities if they can avoid it. Inertia constitutes a general resistance to change and is quite effective so long as the status quo is at all tolerable. Even so, it is to be noted that, in the commercial field, high pressure advertising and salesmanship have done wonders, particularly in the last half century. Such changes, however, deal almost entirely with superficialities, such as styles and gadgetry, not with fundamentals. Since World War II, some half of the people of the United States have had to make at least one major change — in residence, in occupation, or in general pattern of living—as a result of persuations and compulsions in the society. Thus there is ample evidence that the people can and will change if induced to do so. There are many, nevertheless, who would fight stubbornly against any fundamental change. In some instances, this would be due to pathological inertia; in other cases, it would be due to their having acquired position and investments in the status quo; and for some it would be fear of personal inadequacy in a new situation.

The specifications for a fundamental social change on the North American Continent have been provided by Technocracy and widely publicized throughout North America. These specifications are dictated by the physical circumstances of this Continent, the technological requirements, and the population that exists here. Technocracy is not a philosophical utopia, nor is it an expedient compromise with the status quo. The design of operations is such that it would eliminate for all time the phenomena of economic booms and depressions.

On the North American Continent, there is no scarcity of food supplies; rather, the big problem facing the Price System administrators has been one of surpluses. A great deal of effort and expense has been devoted to destroying, dumping, and curtailing production of food materials for the purpose of effecting a salable scarcity in the marketplace. Likewise, the Continent is able to produce an abundance of textile materials for clothing, bedding, and other purposes. Building materials of many kinds are abundant, although certain kinds and grades

of lumber are becoming scarce due to Price System wastage (their uses can be supplied by other materials very effectively). On the whole, there is no deterrent scarcity of building materials. As for transportation and communication, we are overwhelmed with abundance; even though, under the Price System, many individuals may have trouble finding suitable means of travelling from one place to another. Health care and education are limited by Price System interferences rather than by any basic lack of facilities or personnel. As for household furnishings and supplies, we are overloaded in everything from figurines to deep freezers. What is holding us back from the good life? Certainly not any physical consideration.

Economic depressions overtake us when the imbalances in the economic system exceed manageable limits. Prior to 1890, most depressions were based on monetary factors and required only a manipulation of debts to start a recovery. Lately, the depressions, in North America at least, have been based on technological factors; and the effect of these factors is becoming more severe each decade. The 1958 slump obviously is based on efficient technological production, which is able to pile up excessive inventories in a short time; and these inventories cannot be moved because of the high prices and inadequate income on the one hand and saturation on the other. There has developed too great a discrepancy between production and consumption—between gross national product and consumer income — for the system to operate at a prosperous level. The capacity of North America to expand its total debt has been amazing; but even debt expansion has a way of reaching an impasse. Yet, how can prosperity be brought back without a huge new increase of debt—debt that in the end can only be abrogated by inflation, repudiation, or bankruptcy? Where can the Eisenhower Administration suddenly get another half **trillion** dollars of new debt on which to build a renewed prosperity boom?

The economists, politicians, and editors are examining the pattern of past recessions for omens and portents of how this one will turn out—just as they did in 1931 and 1932, with the same deplorable

conclusions. The general conclusions are to the effect that an upturn is soon due; the only discrepancy concerns which month of 1958 will be the crucial month. As we noted earlier, President Eisenhower walked the plank on the March date. Many other economic seers are also losing their powers of prophecy on this one. Most of the economic prophets, not understanding the technological trends, rely wholly on a review of past recessions for their cue. They note that all but one of them exhibited symptoms of recovery within two years from their respective beginnings; therefore, they reason simply, it is a pretty sure thing that the current recession will produce signs of an upturn within two years. There is some difference of opinion as to when this recession started, but it certainly was sometime before the final quarter of 1957; some figure it started in 1956, hence, the upturn is due to come in 1958.

Technocrats know that the 1929-1940 depression was not just a freak condition. Rather, they know that it was the inevitable consequence of long developing trends. It is sure to happen again.

The depression of the thirties was a cheap depression to administer. The first four-year terms of the New Deal cost the government less than the cost of one year of Eisenhower prosperity. A major depression at this time would be many times as expensive as that of the Dirty Thirties. For one thing, the cushion of small farms has been largely eliminated. For another, the numerous essential production and service jobs of that period have been decimated by mechanization. But, perhaps most urgent of all, is the fact that most Americans have gotten away from a pattern of low-cost, primitive-type subsistence. Now, they must have fuel oil, gasoline, electricity, and a continual flow of provisions from the supermarkets. They cannot scrounge a living from the environment. In spite of the alleged political 'safeguards' against depressions, Technocrats realize that bigger and better depressions are inevitable so long as we have a Price System. For what it is worth, the record of the past 75 years reveals that the greater the boom the greater the depression that follows; and, let us comment, never have we had such a boom as the Roosevelt-Truman-Eisen-

hower prosperity binge.

Any slowing down of the 1958 'recession' will have to cost many billions of dollars. At the moment, it is not obvious what those billions could be spent on that would do the job. Technocracy would like to suggest that a real internal development of our Continent be undertaken. But, considering the mentality of the national leaders, this is not likely to be the first attempted answer. The more probable political alternatives are war and large-scale subsidy of private enterprise.

Technocracy's design of operations for the North American Continent would establish a balanced-load economy. It would not be subject to oscillations due to fluctuations in market values and commerce. The needs of the consumers plus the overhead operation of the society would remain fairly constant; while a continuous inventory-accounting system would readily take care of any local discrepancies in the general balance that might occur. None of the factors which contribute to booms and depressions would be operating; hence, the economy would be stable over the years. The standard of living of the citizens would be several times higher than the average of today; yet, the total social cost would not be as much, because Price System wastage and shoddiness would be eliminated. The citizen would receive a high income equivalent to that of all other citizens, regardless of the individual's status in the society. In other words, there would be no wages, salaries, bonuses, or commissions paid out for work or other considerations; but there would be upwards of 200 million unearned incomes distributed to the citizenry to be spent for the good things of life according to individual choice. This income could not be hoarded, transferred, or given away; and no individual could be deprived of it. It would have to be 'lived up' within a given time or it would be cancelled out.

The only catch to it is that such income cannot be provided for only a few persons and denied to the rest; everyone must be in on it. All that is holding it up now is the lack of human consent. When enough North Americans endorse Technocracy to make it effective — say, about three per cent of the population — there can be no holding it back. When-

ever as many as three per cent of the people have been actively **for** something on this Continent, they have always constituted a majority. So it will be with Technocracy. The rest will tag along as they always have.

The question for the individual to ask himself is this: 'Do I belong to the three per cent majority with positive initiative or do I belong to the 97 per cent minority which never accepts responsibility for anything" **—Wilton Ivie**

★ NEW YORK — One of the nation's top industrialists warned in discussing America's economic situation that the cry of 'panic can be as contagious as the cry of 'fire.'

Crawford H. Greenewalt, 55-year-old president of E.I. Du Pont de Nemours and Co., Wilmington, Del., said that this is because 'we no longer have an economy of bare subsistence.'

'Instead, we have an abundance in which a substantial portion of our purchases can be postponed without giving up the necessities of life. Thus, when we become frightened over the business outlook, we decide to get along without some of these new things.'

How long the 1958 recession lasts, Greenewalt asserted, 'will depend largely upon the direction of the national psychology and on decisions that are influenced less by rational economic reasoning than by simple confidence.'

—International News Service

★ LONDON—Sir Gordon Bolton, a leading British banker and international financier, has predicted that the world is in for a long period of economic recession.

'I think the boom is over and money and profits will be more difficult than in the past,' he declared.

'I believe that times have changed permanently. Commodities are not going to be sold in greater quantities or at higher prices for a long time to come.'

Sir George was discussing his first annual report as new chairman of the Bank of London and South America. He previously was a director of the Bank of England and in charge of Britain's international monetary policy.

He said the world is moving into a new international economic era which will be marked by the growing ability of Soviet Russia and communist China to export raw materials and to finance and export capital goods on a substantial scale.

—British United Press

★ WASHINGTON—The recession has sprouted almost overnight as the dominant issue on the American scene.

Politicians just about eat, sleep and breathe recession. Congress swarms with legislative plans to right the economy. President Eisenhower holds conferences with his economic advisers almost daily.

To date, the Republican administration has done relatively little to combat the recession, beyond stepping up federal spending in public works and highway construction and announcing plans to expand its defence expenditures this year.

—Canadian Press

The Great Steel Strike

At the present time the United States and Canada are experiencing one of the most severe and prolonged steel strikes in recent decades. But most people are not aware of the situation, because it is a strike of Management and not of Labour.

THE YEAR 1958 is witnessing one of the most severe and prolonged steel strikes in recent decades. But you do not read or hear much about it and there are no rantings and ravings in the editorial columns of the daily newspapers or the weekly slick magazines. The reason for this is simple: it is a strike of Management and not of Labour.

For months now, the Steel Industry of the United States and Canada has been operating far below capacity, recently in the region of 50 per cent capacity. Yet, we have seen no statistical tables showing how many automobiles, kitchen appliances, baby carriages, and other useful items are being denied the consumers as a result of this strike. At the time of a Labour strike in the steel industry, however, such statistical reports blossom out in abundance. Nor is there any lamentation about the great set-back the military program is experiencing for lack of much-needed steel products.

The great steel strike is editorially excused on the basis that it is a justifiable and unavoidable curtailment by Management in view of the depressed condition of the steel market; albeit, this depressed condition could be attributed in large part to inflated prices which the Steel Industry has arbitrarily and conspiratorially placed upon its products. Under the present economic system, if you can't sell your stuff at whatever price you care to ask for it, you can hold it back from consumption, and 'the public be damned.'

Another thing that is noticeably lacking in this strike is any political or industrial demand that the government take over the steel industry and keep it operating in the interest of The People. This kind of demand accompanies only Labour strikes. In practice, government 'operation' of the steel

industry is a farce anyway, being merely a strike-breaking tactic in support of continued profits for Big Business.

It is probable that the Soviet steel industry will overtake that of the United States in tonnage production either this year or next. Yet, there is no frantic cry that we get busy and keep ahead of the Russians. Keeping ahead of the Russians apparently is important only so long as there are big profits to be made from it by The Right People.

Because of the wide spread between production costs and the selling price of steel on this Continent (and in spite of the greatly reduced labour cost made possible by automaticity), large quantities of steel products are flowing into this area from foreign countries — Japan, Italy, West Germany, France, Belgium, Switzerland, Sweden, Britain — and are underselling our Continental production.

The great steel strike goes on.

Technocracy suggests that the steel industry of North America take advantage of this lull in production to scrap out its obsolescent plants and to bring its best plants up to the highest possible degree of efficiency and automaticity; that, further, it go on a balanced-load production schedule and, while demand is slack, stockpile massive quantities of standard sheets, plates, rods, tubes and forms, as well as ingots, and that these be placed under rust-proof conditions. Then it would not be necessary for the steel industry to experience booms and depressions in the future; rather, it could operate at a steady pace.

But, alas, under the Price System, the North American steel industry is not set up for the primary objective of making steel—its primary objective is making profits for its stockholders. This situation in the Steel Industry illustrates how absurd it is for North Americans to further tolerate the existence of the Price System on their Continent.

—Techno Critic

★ SAN FRANCISCO—A drug 100 times stronger than morphine in pain-killing ability has been produced in the laboratory and is being tested on humans and animals.

It offers chemists an opening to develop a new line of better as well as stronger pain-killers, said Bill Elpern, drug researcher at Cutter Laboratories, Berkeley, Calif., before the American Chemical Society. *—Associated Press*

Point of No Return

Like the big airliner on its trans-oceanic flight which has passed the half-way mark, North American society has reached its technological point of no return. The citizens of this Continent must go forward to a new social system.

THE BIG AIRLINER, several hours out on its long trans-oceanic flight, is still far from its destination. Suddenly its smooth flight is disturbed by a series of coughs and splutters from one of its four motors. Immediately the pilot contacts the navigator for instructions. Should he return to the take-off field or continue on course? Soon the answer comes back. The halfway mark is behind, so come what may there is no choice but to proceed. They have passed the point of no return.

Airmen, especially those flying ocean routes, are keenly familiar with this term and all it implies. Can the same be said for the personnel piloting the course of society? Do they recognize in the 'point of no return' an analogy to their own position? There is an important distinction. Once the crippled airliner reaches land it may have the choice of several fields upon which to land. A society, however, which has travelled a course of increasing technological complexity has but one 'airstrip' available—namely, that marked by scientific functional governance. Landing short of it because of the directive ineptitude of its political administrators, the society can only meet d i s a s t e r. A successful landing thereon can usher in a magnificent social era.

North Americans have passed their point of no return. When? It is hard to say definitely for there is much more to the problem than simply halving a given distance. Unquestionably, though, had it not already been passed beforehand, it certainly was during World War I when improved and installed technology increased to an extent which meant that henceforth **fewer** manhours would be employed to produce **m o r e** goods.

It is not too important to know or remember when this event occurred. Much more vital is the

realization that there can be no turning back now to any earlier stage in our social progression. Our only future course lies in ever greater integration and interdependence of the Continent's physical mechanisms. It follows naturally that the obsolete Price System must yield to a functional administration by personnel whose training and capabilities naturally equip them for the responsibility of administering the physical equipment and social affairs of this land area.

The fortunes of the Price System have fluctuated violently in the past three decades. Under often unfavorable circumstances which have existed, could even its most ardent advocates be blamed for wishing (secretly if not otherwise) that effective brakes might be applied to accelerating technological progress? After all, its excessive productive capacity was proving increasingly embarrassing to the economy.

In the early stages of mechanization every practical innovation had been financially advantageous, for the necessity to increase manhour employment simultaneously with proposed production increases resulted in an overall boost in buying power and hence in sales turn-over. Furthermore, there was virtually no danger of overproduction, for geographical and population expansion was proceeding at an unprecedented rate. The first 60 years of the 19th Century, for instance, saw a six-fold increase (from five millions to 31 millions) in the United States' population. This was followed by a further two-and-half-fold increase (to 76 millions) in the remaining 40 years, by which time most arable areas across the country were settled to greater or lesser degree. During this period it was barely possible for the infant technology to keep pace with even the **minimum** demands of a predominantly pioneer population.

The decline in geographical expansion was accompanied by a deceleration in the population growth rate. Accordingly, technology — which had also grown apace meanwhile — was able to catch up with increasing demands being made upon it. Not only did it meet these demands but many others of varying degrees of importance which were being fabricated to urge upon the buying public. North America was pass-

ing from the age of scarcity into that of abundance. Employment was still at a high level so Price System controls were still reasonably adequate. Sales were practically all on a cash basis with customers showing satisfying susceptibility to newly available gadgetry. The so-called Gay Nineties might indeed have been a good time to apply the brakes and continue at a pace the Price System could handle. Its failure to do so is attributable to a variety of reasons.

Foremost was the nature of the P r i c e System's anatomy which forbade (and forbids) any slowing down process. Its health depends upon continued expansion — a feature which places it in serious opposition to its environment, for in the physical world there is always an outside limit to growth. Modern technology speeded up expansion enormously, but in the process brought the Price System in a few short years to a crisis which might never have developed had crude handtool production methods been retained.

Even were this not the case, however, there still would have been little chance of a slow-down in the onward plunge toward the untenable position the Price System now occupies. Why? Simply because nobody recognized the significance of the trends, or at least if there was such knowledge it was never heeded. North America entered the 20th Century on a wave of unprecedented prosperity, the door to more of the same left ajar only enough to lure business leaders irresistibly into opening it further. With characteristic myopia these men saw only the immediate prospect of new wealth within their g r a s p. There was little inclination to e x p r e s s or show concern for the effect of present expansion on future expectations. Let the future take care of itself!

That 'future,' from the earlier perspective, has had a progressively harder time to take care of itself. The forward progression of technology, given extra impetus by the material needs of World War I, brought about conditions which had never existed before and which the Price System was unequipped to handle. A relatively s e v e r e depression in 1908, m a r k e d by an extensive shutdown in the key pig iron industry, presaged forthcoming difficulties.

(*Continued on Page* 33)

OBSERVATION - STUDY - ANALYSIS - REPORT.

RESEARCH BULLETIN

MAY, 1958 *Compiled by Editorial Staff* No. 112

Automation Gets It Wholesale

INDUSTRY has been turning more and more electronic controls to mastermind machine tools and production processes. Now it's applying the same concepts to distribution of goods that have already been manufactured.

This spring, Industrial Electronic Engineers, Inc., of North Hollywood, Calif., is crowing over its maiden venture into this field—an electronically controlled order filling machine installed in the Los Angeles warehouse of Brunswig Drug Co. Brunswig is one of the nation's biggest independent drug distributors, with nine warehouses covering the West.

Working from punched cards, the new device takes only a few seconds to fill an order for as many as 160 different products, in lots of up to 99. An experienced stock clerk would need 20 minutes to do the same job by hand. Though the machine cost $250,000, it reduced the number of order packers necessary from 20 to 11 at peak hours and six normally. And in three months of operation, the complex system has scored something like 99.7% usefulness—practically no

down time at all. It is named the RVS Mark I, in honor of Brunswig Pres. Roy V. Schwab.

Enlargement Due—Most of Brunswig's warehouse business consists of orders for less than a case; in Los Angeles it stocks approximately 34,000 items. The automatic equipment can now handle only 1,800 items—but these account for 50% of the warehouse traffic. It will soon be enlarged to stock even more of the items most in demand.

Home for RVS Mark I is a space 90 ft. square in one corner of the warehouse. The setup includes 18 merchandise bays, each 40 ft. long with groups of electronically controlled stock chutes spewing goods onto a system of conveyors. Nine of these bays are on each side of the conveyors, to which all 18 are at right angles. Each of the five main conveyors handles only one order at a time.

Old and New—Before the new machine was installed, clerks filled orders by pulling items by hand from banks of shelves laid out at right angles to a conveyor system that moved slowly through the warehouse. To do this, they might have to travel as far as 60 ft. to fetch a single item. Orders for delivery the same day could not be accepted after 10 a.m.

Now same-day orders can be taken until noon, because RVS Mark I will fill 2,000 orders a day—with an error factor of 0.1%.

Mechanics—It's easiest to explain how the new machine works by tracing the steps of a typical order through the warehouse.

When a drug store telephones an order, it's typed directly onto a preliminary invoice. A clerk pulls IBM punch cards giving the retailer's name and address and affixes a delivery routing tag to the invoice. Then the invoice and identification cards go to another room filled with tubs containing an IBM card for every single item stocked in the warehouse. A card is pulled for each item in the druggist's order, and the entire batch of paperwork moves into a room where all the information — items ordered, code numbers, prices — is combined electronically onto a final printed invoice. At this point, too, a card sorting machine separates the IBM cards for items that must be picked off the shelves by hand.

Next, a conveyor hauls the final invoice and the two sets of IBM cards to the control bridge of the order filling machine. One bunch of cards is fed into the machine's computer section; the other is processed manually.

The computing equipment checks for errors in the IBM cards and its own operations, then selects one of the five collector conveyors for the order. It flashes this information, together with the order's code number, to the control panel and, finally, activates the mechanism in the merchandise bays.

Down the Chute—Ensconced in each of the 18 bays is an eight-hour supply of goods—about 100 items in each bay. The merchandise may be anything from razor blades to diapers, contained in jars, boxes, bottles, tubes, or multiple packs. They are all stocked in chutes inclined at an angle of about 20%. At the bottom of each chute, there's an electronic dispenser to release the proper quantity of each item, counting as it goes along. If there isn't enough of an item in the chute to fill the order, the dispensing process shuts down for a moment, and the machine lets the operator know which items are missing.

One reason for the machine's speed is that orders are filled in parallel drops rather than in series. All the dispensers can best be working simultaneously.

Ten at a Swoop—After the items have been selected and dispensed, the 18 bay conveyors put them onto one of the collector conveyors. Here the order is kept together by diverter gates operated by the computer. At the control bridge, it's stopped until a packing station is clear to receive—then released. At the same time, the paperwork is dropped through a chute from the control bridge.

At any one time, 10 orders can be processed—five being packed, five more being dispensed or waiting to be packed.

After the automatically assembled items have been packaged, another conveyor shuttles them to the other side of the warehouse, where the handpicked and refrigerated drug items are added to the order. Then the order makes its last warehouse move—to the shipping area for final packaging and delivery to the druggist.

Bigger Job Ahead—To enlarge the machine's capacity it would only be necessary to install more bays and make the collector conveyors longer, according to Industrial Electronic Engineers. The present control equipment could handle as many as 10,000 different items, compared to the 1,800 now stocked. Brunswig's current plan is to up capacity to 5,000 items—or about 80% of the daily business of the warehouse.

Though the machine's error factor is only 0.1%, human error can be more of a problem. The chutes are stocked by hand, and sometimes merchandise goes into the wrong chute or is inserted incorrectly, causing a jam. Occasionally, stock clerks accidentally drop goods into the conveyor system while it's running, and this can result in a mistake in final delivery.

Things can also go wrong at the outset—for instance, clerks pull the wrong IBM cards. The designers say this kind of error could be avoided by using IBM's new computer storage equipment, RAMAC, in place of the IBM cards.

Dry Runs—Brunswig's machine has been in the works since 1954. It was tested in prototype first; work on the full-scale RVS Mark I began in February, 1957.

Industrial Electronic Engineers is now scouting for other ways to use this sort of equipment. Now that the $250,000 pioneer model has been perfected, the company says, machines based on the same concepts might cost as little as $40,000 and up. The original could be adapted for grocery warehouses, photo supply distributors, auto parts suppliers, and the like with a minimum of engineering changes.

—Business Week

Electronically Controlled Automobile

WARREN, Mich. — An automatically guided automobile cruised along a one-mile check road at General Motors Technical Centre recently, steered by an electrical cable beneath the concrete surface.

It was the first demonstration of its kind with a full-sized pas-

senger car, indicating the possibility of a built-in guidance system for tomorrow's highways.

Dr. Lawrence R. Hafstad, vice-president in charge of GM Research Staff, said the demonstration car, a 1958 Chevrolet, was guided by a combined electronic computer and servo system which takes over human steering control by following a magnetic path produced by low frequency power in the highway cable.

The car rolled along the two-lane check road and negotiated the bank turn-around loops at either end without the driver's hands on the steering wheel.

To turn off the road or pass another vehicle, the driver merely touched a switch on the steering gear which cut back into the manual steering system.

'This is a "breadboard job," something put together to test the idea of electro-magnetic vehicle guidance,' Dr. Hafstad explained. 'It is the hardware phase of a system demonstrated in model form in 1953 by Radio Corporation of America.'

Meanwhile, he said, RCA had set up a test strip near Lincoln, Neb., with the road equipment for a signal system.

'Actually,' Dr. Hafstad explained, 'our job was to take signals like those of RCA's from the road and put them through specially designed equipment to steer a full-size car.

'Our particular system,' he added, 'is still in the research stage and as yet is limited to steering control. We think of it as the first "building block" in what may become a more sophisticated system for controlling vehicle spacing, detecting location of cars or giving the driver signals for throttle and brake control.

'Obviously, we can't predict what may evolve from this basic steering guidance technique. But it points out the kind of ideas we are exploring,' Dr. Hafstad said.

Joseph B. Bidwell, head of GM Research Staff's Engineering Mechanics Department and director of the guidance system project, explained that the technique of automatic road vehicle guidance is unique. It cannot be compared directly with any other guidance technique such as those used in aircraft or guided missiles.

Low frequency alternating current in the highway cable creates a circular magnetic field that extends the length of the cable, something like a very short range radar 'beam.'

On the front bumper of the test vehicle is a pair of tuned pickup coils which straddle the cable's magnetic field.

As the car follows the magnetic path, the voltage across the terminals of the pickup coils depends on the magnetic field strength. Any deviation or lateral motion of the car causes a difference in voltage from one pickup coil to the other.

These voltage variations feed into a small electronic analogue computer on the instrument panel which, in turn, is linked with a servo system that controls the car's modified power steering unit.

In effect, the computer measures the difference in voltage and automatically adjusts the steering onto the magnetic path through the servo system. The computer puts out 'command' signals to the servo mechanism which positions the front wheels.

Thus if the car undergoes any rolling, sideslipping or yawing motion — deviations from its straight-ahead course — the automatic steering system brings it back into the straight-ahead path.

Mr. Bidwell explained that the important problem of the system's stability in substituting for human steering was solved in a series of studies with a special electronic analogue computer developed in his department's laboratories.

This computer was outfitted with a steering wheel. Linked to the computer and steering wheel combination was a simulator with a miniature car which reacted to various 'inputs' at the steering wheel, just as a full-size car would react to the driver's steering motions.

By working out various steering and car handling mathematical equations on the laboratory computer-simulator setup, engineers were able to devise the servo system to give the full-size test vehicle continuous stabilized guidance.

Dr. Hafstad and Mr. Bidwell pointed out that types other than their electro-magnetic system could be applied to vehicles, but their particular choice was based on its ultimate simplicity.

Among other things, it would require only low frequency power,

its sensitivity is good and with the cable planted in the highway concrete it would suffer no weather or radiation interference.

Also, they said, the system probably could be easily integrated into a highway network, possibly in the form of a separate 'automatic lane' for those cars equipped with the device.

In other words, they explained, the system would be feasible in a transition period during which automatically guided and non-automatically guided vehicles were using the highways.

William F. Hufstader, vice-president of GM Distribution Staff and chairman of the Automobile Manufacturers Association Highway Policy Committee, said the guidance system 'appears to offer long-range promise of a significant contribution to highway and vehicle operation.

'This isn't an impracticable dream. It reflects an extension of a steady trend towards greater reliance on automatic devices for both vehicle operations and traffic control, as represented by such developments as automatic transmissions and electronic traffic signal systems,' he said.

'Safe and efficient movement of the future's greatly increased vehicle traffic demands further technical progress in vehicle and traffic control methods. We hope our research in this area will help point the way to constructive cooperation between automotive, highway and traffic engineers in exploring this field of automatic guidance,' Mr. Hufstader declared.

Dr. Hafstad recalled that in the 1956 Motorama the idea of a future highway guidance system was dramatized in a motion picture showing the experimental gas turbine car, Firebird II, 'sniffing' along an electronic control strip for automatic steering.

In this fictional Motorama film were a number of ideas that figured in preparation for the trial runs over the 'automatic road' at Technical Centre, he said.

Last September 24, in a speech before the Institute of Traffic Engineers at Detroit the GM vice-president urged traffic specialists and highway engineers to consider stepping up their research in vehicle and highway guidance systems.

Professor Predicts 5-Day Weekend

VICTORIA — Dr. Gordon Shrum, dean of graduate studies at UBC, predicted a 'five-day weekend' with the advent of automation when he spoke to a joint luncheon of Rotarians and B.C. Natural Resources Conference delegates.

'Aeroplanes can already work without a navigator or an operator,' he said. 'Pilots will soon be the most overpaid workers in the community.'

'The stewardess will be the last to go — she's beautiful — and there's no sense developing a machine to pass out pillows and gum.'

And there will be changes in agriculture. 'The hen is already mechanized.

'The cow won't wait over the long weekends, but even so in 50 years, she, like the milk maid, may only be remembered in song and story.'

Dr. Shrum said the only thing keeping mankind from reaching the 'leisure state' of tomorrow, is the problem of distributing goods to people who don't have the labor to produce them.

'Technological know-how to instigate automation of transportation and manufacture is already on tap,' said Dr. Shrum, 'but the human element stops us.'

'In the past labor was exploited,' he said. 'Let's now exploit machines for the benefit of labor, capital and consumer—that means all of us.'

Man's long struggle for thousands of years to support his daliy needs will be ended within 50 years 'by the five-day weekend,' Dr. Shrum predicted.

He sounded a warning that labor must be prepared to retrain for new jobs workers who become outmoded through automation.

'This argument about what to do with diesel firemen is foolish,' he said. 'They should be worrying about what to do with the whole train crew — transportation is the great field for automation.'

—Canadian Press

Automatic Factory Riddle for Labor

LOS ANGELES — The automatic factory has arrived and the things it makes may include headaches for both labor and management.

Push-button production on a small scale was demonstrated here recently. Perforated tapes and electronics replace the human element in this system, designed to save labor.

How much labor saving the economy can withstand is a question on which both company and union officials are understandably cautious but both concede that automation is developing far more rapidly than most people realize.

A group of reporters saw what Hughes Aircraft Co. calls 'one of the most jealously guarded industrial secrets of the West.' This is a bank of machine tools designed jointly by Hughes and the Kearney and Trecker Corporation of Milwaukee. The machines make parts for armament control systems.

Three machine tools—for milling, drilling and boring—operate simultaneously and automatically through an electric control panel. Punched tapes feed specifications into computers: The computers feed the data into the machine tools.

One man, without previous machinist's training, can control the machine.

Manpower figures were conspicuously lacking, but a company spokesman said this system will save three to five times the labor and time heretofore required to produce a part or component for an aircraft or missile.

Automatic factories, an industry representative said, probably will be in operation before man reaches Mars, 'and you can no more stop it than you could have stopped the advent of talking pictures.'

—Associated Press

Nature's Tiniest Building Block

SAN FRANCISCO — Man's first glimpse of Nature's smallest 'building block' atomic element—berkelium—has been achieved by University of California scientists in Berkeley.

Dr. Glenn T. Seaborg, UC professor of chemistry, told the American Chemical Society convention that the first visible sample of berkelium — element 97 in the atomic scale — weighed about one fifteen-hundredth of a grain of salt. And a salt crystal weighs only 500 micrograms.

'This was the smallest amount in history involved in the measurement of a chemical element,' he said.

Berkelium was finally isolated and identified in a continuous program that took more than five years to complete. The new element, he reported, has a half-life of 280 days.

Seaborg said positive idententification of berkelium added a great deal to our knowledge of atomic and nuclear structure.

While discovery of elements having atomic weights up to 102 already have been reported, none beyond 97 have been proven by chemically visible methods. They have been partially indentified by the nature of their radiation so far.

'It does not appear that it will ever be possible,' Seaborg told the chemists, 'to isolate visible or weighable quantities of any element with atomic numbers greater than 99.'

The value of the mere sperk of berkelium — now suspended in a solution in the Berkeley reactor—is fantastic if figured in dollars.

To produce one pound of it in equipment built specifically for the purpose, Dr. Seaborg estimated it would cost $10,000,000,000,000,000,000,000,000,000, or 10 quadrillion dollars.

—International News Service

★ CHICAGO—For night aerial photography, 12 tiny lamps, each smaller than a cigarette, have been developed to emit light equal to 36,000,000 candlepower.

Housed in special reflectors, the lamps, tested in a patrol bomber flying at 20,000 feet, gave enough light at night to cover 16 miles and enabled people on the ground to read a newspaper. *—Associated Press*

Through the Technoscope...

Technocracy examines the various scientific and technological trends in North America today which point to the necessity for a new social mechanism that will provide security and abundance, with a minimum of working hours, to every citizen on this Continent.

AN ELECTRON TUBE NOT MUCH larger than a shirt button yet capable of operating at temperatures from 900F to 1,500F, has been developed by General Electric. It's made of layers of titanium and a special ceramic, like its larger predecessors developed by PGE. Still in the laboratory stage, it will bring the electron tube down to transistor size when it's commercially available.

A ROBOT MACHINE CAPABLE OF producing nearly every type of stroke in the game of tennis is being exported by Australia. Powered by a ¼-h.p. electric motor, the unit can easily be pushed to any part of a tennis court and holds 45 balls which can be fired at different velocities by making simple adjustments.

A NEW DESIGN FOR POWER transformers developed by Westinghouse Electric Corp. makes it possible to build units with ratings up to 600 Mva. Highest rating on conventional three-phase transformers is 380 Mva. In the 'inner-cooled' design, oil is circulated between the strands of parallel conductors that are at the same electrical potential, eliminating oil ducts between coils and windings. This allows the use of materials having higher insulation strength than oil, so smaller, lighter units of higher capacity can be built.

THE FIRST AUTOMATIC DEVICE to make change for paper currency, long a vexing problem to vending-machine operators, has been announced by Chicago's A.B.T. Manufacturing Corp. The table-model machine changes $1 bills by scanning the bill through six holes with photo-flood lights, registering the beams on a light-sensitive surface. The machine recognizes and rejects conterfeits, foreign currency and bills of wrong denominations. It can be modified to handle $2, $5 or $10 bills.

A CONTROLLED VIBRATOR HAS been developed to replace the conventional tumbling barrel for descaling and fine finishing of metals and some plastics. It uses a combination of springs and a counterweighted elliptical drive shaft to shake, slide, and scrub pieces in the same processing compounds used in a tumbling barrel. Over a long cycle, the vibrator removes 10 times as much as a tumbling barrel, according to the maker, Lord Chemical Corp., York, Pa.

A NEW LOAD CONTROL SYSTEM has recently been designed for use on grinding mills or similar equipment. Developed by U.S. Electrical Motors Inc., this new system consists of a U.S. Varidrive, with Varitrol Automatic Control, driving the feed conveyor and an A.C. constant speed motor operating the mill.

DEVELOPMENT OF A NEW ANA-log computer to solve the complex prob-blems of economical inter-area power gen-erating scheduling has been announced by the General Electric Computer De-partment at Phoenix, Arizona. The com-pany's new economic dispatch computer simulates four generation and transmis-sion areas and may be used for computa-tions involving economic scheduling and tie line power cost calculations.

A CALCULATOR THAT ADDS, SUB-tracts, multiplies and divides up to ten digits, yet weighs barely six pounds, will be put on sale by Manhattan's Bohn Duplicator Corp.

HIGH-SPEED ELECTRONIC COM-puters are proving to be a tremendous shortcut for patent examiners who some-times must search up to 100-million docu-ments before granting a new patent. The U.S. Patent Office and the National Bureau of Standards have been collabor-ating on a long-range program to apply automation to the problems of patent researching. In experiments recently con-cluded, a computer successfully answered typical questions in a patent appication by going through more than 200 descrip-tions of steroid chemical compounds.

AN INSTRUMENT SO SENSITIVE that it can detect a thousandth of a gram of chromium-51 dissolved in a river has been developed by General Electric scientists at Hanford, Wash. The device can measure concentrations of radio-iso-topes even lower than those normally occurring in meat, milk or vegetables. It works on the basic principle of gamma rays and coincidence gamma ray spectro-metry -- a relatively new tool used by atomic scientists to detect radiation and then to identify and measure each con-tributing radio-isotope.

★ LONDON—Russian experts have designed an electronic 'train engineer,' and and an electronic device to read print, Tass reported.

The 'train engineer,' known as an automatic cybernetic device, obeys all signals, chooses the correct speed and stops at stations.

The 'reader,' built by engineers in Odessa, uses a cathode ray tube similar to that in a television set to scan the lines of the text and translates it into a telegraphic code. Linked with a teletype, it can transmit texts without the help of an operator.

★ LUXEMBOURG—The six-nation European Coal and Steel Pool has granted $850,000 for research on a machine to reduce human labor in coal mines, it was announced here.

A spokesman said a blueprint for the machine, which would automatically dig underground galleries and might also extract coal, had been drawn by French and German experts. —*Reuters*

★ LONDON—Radio Moscow said that Russia now has produced a driverless bus.

The Communist radio quoted an engineer at Leningrad Institute of Electrical Engineering as saying that 'the bus has an electronic brain, remembers things and even comes to logical conclusions. There are transistor photo-elements in the front which are the bus' eyes and signal to the motor what to do.' —*British United Press*

(*Continued from page* 20)

Following the war came the much more severe 1921 depression with its proportionately more drastic reduction in pig iron production. This time, with the highest point in industrial employment of man-hours having been passed, the problem was considerably more difficult to solve than in the earlier instance. Large-scale installment buying was introduced to rescue the economy from this spasm. On the premise of expected continued employment, future income was mortgaged to buy more articles than could be purchased on a strictly cash basis. The innovation worked fairly well for a while, but production techniques were becoming too fast for even it to cope with the plethora of goods pouring off the flow-lines. In 1929, the bottom dropped out of the market, plunging North America into the decade-long Great Depression which demonstrated the first major proof of the Price System's inability to cope with conditions of abundance.

Business and political leaders found themselves in an unenviable position from which they could not extricate themselves by usual means. They were bewildered by the spectacle on the one hand of huge quantities of merchandise waiting to be bought; and on the other by multitudes of unemployed would-be customers. What a situation! Deeply perplexed, they turned to the only 'solution' presenting itself within the framework of their revered Price System. First of all, many unemployed were put to work in fabricated government projects which, while mostly of meagre social benefit, kept the men from being too uncomfortably aware of their indigent state. Said projects, of course, were not such as would interfere with the prerogatives of 'free enterprise.'

As for commodity prices which had been put on the skids, purely Price System logic was employed to bolster them. If an abundance of consumer goods was responsible for the price slump, then scarcity must be created as a counteracting measure. This distorted outlook was responsible for the wholesale destruction of crops, fruits and vegetables and the wanton slaughter of livestock while a considerable segment of the population was in dire need of them. Most readers will remember the period vividly

enough to need no further reminders of the extraordinary tactics employed to keep the Price System going.

World War II was a much more successful means to this end. Never before had 20th Century technology had such an opportunity to perform at so high a load factor without having to worry about the effects of its production upon the economy. Never was it made more evident that to keep ahead of the increasing efficiency of that technology the Price System must employ ever larger and more drastic schemes —whatever the destructive cost to society. Such schemes, however, can only retard a social trend which has gone too far toward an economy of abundance to allow any turning back, irrespective of what happens to the obsolete Price System.

The predicament presently facing this scarcity-born economy is comparable to that unnecessary foolhardiness which each year brings tragedy to numerous holidayers. Who has not read accounts of rowboats, carrying several passengers beyond specified load limits, being swamped in rough water some distance from shore? Usually in such cases there are some lives lost, but only **after** the swamping has actually occurred. The Price System, by contrast, has brought tragedy to millions of North American citizens **before** succumbing to the overloading far in excess of its design limitations. This overloading was not immediately apparent, but is becoming ever more so under the developing stresses of accelerating current events. It is problematical how much longer this scarcity economy can operate, crippled by managerial ineptitude and staggering under a plethora of goods it was never equipped to handle.

What indications have we of how far North America has gone along the unidirectional and irreversible way to a new economy of abundance?

One of the most important is automation. While the word is new, the process it now labels was predicted a quarter century ago by Technocracy Inc. which described the coming technique as the automatic factory. North Americans scorned the idea. A workerless factory? Impossible! Today, however, automation has already belied more strongly than

anything else the phony Price System argument that 'machines create jobs.' No such purpose was intended from the beginning, despite an initial tendency for new jobs to be created faster than old ones were destroyed. This situation has not prevailed in North America for 40 years. Even where new jobs have been created during this latter period they have become mechanized so fast that total industrial manhours employed have continued to decline.

Automation is the latest contribution to the economic uneasiness of labor ranks. Recent installations causing grave concern include: (1) an automatic engine plant that produces double the number of its predecessor with one-tenth the manpower; (2) automatic letter sorters, each doing the work of 200 hand sorters, being installed in many metropolitan post offices; and (3) electric light bulb robots that turn out 2,500,000 bulbs every 24 hours without human assistance—18 of them producing the entire needs of the United States. Though these examples affect a relatively small proportion of the labor force, they indicate what can be expected throughout industry in the early future.

Record high inventories are another indicator. Despite low down payments and long-term sales contracts, goods are not moving off the retail shelves fast enough for economic health. This is not surprising, seeing that one-tenth of the labor force is presently unemployed. (Who said machines create jobs?) The postwar boom when anything could be sold to anybody has passed, leaving behind a lethal combination of mounting surpluses and dwindling customer potential. Cutbacks are occurring in various fields, causing further unemployment and reduced purchasing power.

Technocracy Inc. has for 25 years pointed the way North American society must go to conform to the pattern established by a supremely provident land area and an advanced technology. While the Price System, with treasonable mismanagement of resources, personnel, et cetera, has brought us thus far, it is fast weakening under the heavy overload which has burdened it since the First World War. There will be few tears shed for it at its demise. Meanwhile, Technocrats

across the Continent have been informing their fellow citizens by literature, lectures and other avenues of contact that the sole future of North Americans lies in the adoption of Technocracy's social blueprint. Current events are vindicating that contention with a vengeance.

Technocracy Inc. invites you to learn more about the factors which are bringing North America close to its rendezvous with destiny. What is that destiny? You may learn that also through the Technocracy Study Classes which are conducted regularly throughout the Continent. As a citizen of this land area it behooves you to be informed about the 'only program of social and economic reconstruction which is in complete intellectual and technical accord with the age in which we live.' The information gained through Technocracy's educational channels may well be your intellectual point of no return on the way from inane Price System bungling to the planned sufficiency of the North American Technate. **—Rupert N. Urquhart**

★ WASHINGTON—U.S. government officials estimate that American production has fallen by a rate of about $15,000,000,000 a year below the boom level of six months ago.

The commerce department's estimate of total national output shows that the $7,500,000,000 skid in the last quarter of 1957 was approximately equalled by the further drop in the first quarter of 1958.

The report bolsters other evidence that the recession already is deeper than the downturn of 1953-54 and in several respects is matching the sharper slump of 1949-50 before the Korean War started.

Gross national product has dipped from $440,000,000,000 to an annual rate of about $425,000,000,000 or less, the report reveals. *—Associated Press*

★ OTTAWA—Unemployment climbed to a record 590,000 at mid-March, the government reports.

One in every 10 persons in the labor force was without a job and seeking work.

The figure, based on a bureau of statistics survey of 30,000 households March 22, marked an increase of 35,000 from the number of jobless at February 15.

—Canadian Press

★ MORE THAN 1,000 University of B.C. students will be without jobs this summer unless the employment picture brightens, UBC officials said.

'We have a file of 1,000 applications for jobs,' said one official, 'and not a single prospect to offer to students.' He said that several large forest product firms, which usually hire 50 or more students, have not even bothered to conduct interviews on the campus this year. *—Vancouver Province*

Scientists Under Fire

The article below is adapted from a speech delivered recently by Dr. Edward U. Condon, formerly director of the U.S. Bureau of Standards, who was hounded out of his post in 1954 although cleared by many investigative bodies.

I WANT to tell you about the political abuse of the personnel security system, which has done so much in the past decade to blight the relations of loyal American scientists and their government. I hope that this will be the last time that this subject will need to be discussed. The evil consequences of bad policies have now come home to roost in a way that is plain for all to see. It may be that conditions have now become bad enough at last that the Administration will soon seek to remove from itself the badge of dishonor it has worn for so long.

During the last two months there has come about a general public awareness that America is not automatically, and effortlessly, and unquestionably the leader of the world in science and technology. This comes as no surprise to those of us who have watched and tried to warn against the steady deterioration in the teaching of science and mathematics in the schools for the past quarter century. It comes as no surprise to those who have known of dozens of cases of scientists who have been hounded out of jobs by silly disloyalty charges, and kept out of all professional employment by

Herblock in The Washington Post

"Dear Boy, Where Have You Been Keeping Yourself?"

Reprinted from THE PROGRESSIVE.

widespread blacklisting practices. It comes as no surprise to those of us who have known how good American scientists have had to face vilification by political speech-makers in and out of Congress, and have been falsely prosecuted for perjury, and have been improperly denied passports, or have had their passports seized and invalidated without due process by the State Department, or who have had their telephones tapped or their letters intercepted by government agents. For while we are rich and powerful, we have not been true to the principles of freedom for which we stand.

Over the past ten years I have had two full-scale loyalty hearings in the Department of Commerce, a full-field investigation by the Atomic Energy Commission, and finally in 1954 a hearing under the policies and procedures set up by this Administration. In all of these I received full clearance. All covered essentially the same ground which was no ground at all. The House Committee on Un-American Activities made numerous attacks on me in 1947 and 1948 before its then chairman (J. Parnell Thomas) went off to serve a term in the federal penitentiary as a common crook. Finally this Committee staged a political hearing on the same old stale and outworn material just before the 1952 elections.

During most of this period I kept on working to develop the scientific strength and stature of the National Bureau of Standards. Happily this work is being carried on by my successor in spite of his having been summarily fired for a time by the present Secretary of Commerce who wanted the free play of the market place to take precedence over careful scientific experimentation.

Professor Edward Teller told the last personnel security board hearing in April, 1954 that the Bureau's work on the hydrogen bomb which I organized advanced our achievement of that goal by many months, probably a year. If he is correct in the implication that without that work we would have been delayed by about a year, then the lack of that work would have made us come in second in the international rivalry for the hydrogen bomb.

Nevertheless all the old stuff was rehashed once in 1952 and

again in 1954. I was badgered all those years for having been interested in the American-Soviet Science Society, an organization which received a grant from the Rockefeller Foundation ten years ago to foster translation and wider distribution in this country of the Russian scientific literature. Now, a decade late, we read of crash programs to translate the Russian scientific literature and spread it around in this country.

In July, 1954, I was given complete security clearance by the Eastern Industrial Personnel Security Board. You might think that I would now be allowed to go back to work. Yet, in October, 1954, just before the elections, we find Richard M. Nixon making his twenty-years-of-treason speeches boasting that he got the Secretary of the Navy to suspend my clearance, as was done on October 21.

It was arbitrarily suspended without any pretense that additional evidence needed to be considered. It was suspended by a Secretary of the Navy who admitted that he had not seen the record. I was told that I would have to go through the same old dreary business again. Three years ago I faced a difficult decision — whether to continue to fight for the government's honor, or whether to yield to the Administration's determination to disgrace itself. Exactly three years ago at Thanksgiving, I was driving from Corning to Washington to take counsel with various friends on what to do.

Try to picture the situation. I had been under steady political attack for seven years, and had won at every hearing. But now I was told that I would have to go over all the same material again, before a kangaroo court whose members were to be handpicked to do their job by Defense Department officials. Many of my friends had been persecuted by the House Committee on Un-American Activities. Some of them had taken refuge abroad from these political persecutions of our scientists. Our good friend and past president, Robert Oppenheimer, who brilliantly built and led the Los Alamos laboratory during the war, had just been publicly disgraced by an official action of the government — largely on the basis of recently developed hysterical attitudes toward things that had happened before the war. The scientific

staff of the Signal Corps Laboratories at Fort Monmouth had suffered a blow from which it has not yet recovered through the irresponsible attacks of Joseph R. McCarthy — attacks which the President had not resisted until Sen. McCarthy began lobbing his shots toward the White House. Then at last our President acted, but in his own self-interest, not in defense of honor and decency and fair play to scientists, or to any of McCarthy's other victims.

Under these circumstances . . . I decided the situation was hopeless and that I had done all that could reasonably be expected of me in having resisted these evil dishonorable forces for seven long years.

In those seven years so much of my nervous energy had gone into the struggle that I was weary until sickness, and was forced to neglect the proper courtship of my beloved profession. So I decided to withdraw from the struggle, and my resignation from an industrial position for which security clearance was needed was announced in early December.

You might think that I would now be allowed to go back to work. I came East in January, 1955, after giving my retiring presidential address to the American Association for the Advancement of Science and was offered the post of chairman of the department of physics in a leading university. In March the chancellor of that university told me that he could not follow through on the appointment because a high government official threatened one of the university trustees that if my appointment went through, that university would lose all of its federal funds.

In June of 1955 I was asked to serve on a committee on a nonclassified problem of military importance -- and then suddenly asked not to, just before the first meeting of that committee.

Incidentally I was cleared from July 1954 to October 1954. During that period some Navy people came to see me with an urgent problem on the development of a radome for a guided missile. It was highly secret, but I was cleared for it. By the time we had the development models made my clearance had been suspended, 'pending further consideration,' as Secretary Thomas put it. Some of our cleared young men tried to deliver the radomes but found

these Navy men in such a state of panic that they would not accept them. A few weeks later — all this was just three years ago —they regained their courage and sheepishly asked to have the radomes. They were t e s t e d and found to be good and are now in production. Detailed p r o b lems about them come up from time to time but I am not allowed to help in their solution.

In connection with all the soul-searching that is going on, we hear a good deal being said about asking Robert Oppenheimer back into government service. I hope this is done — humbly and with apologies for the horrible way he was t r e a t e d. The government ought to make honorable amends to him and others — but we all must recognize that if basic research is to be done, an excellent job of teaching must go along with it, and our very best people are needed for both these things. The very best physicists can make their most worthwhile contributions in these ways rather than in weapon development.

—Edward U. Condon

★ EDMONTON—A University of British Columbia physicist debunked the idea that educators can concentrate too much on science, and so produce a race of 'barbarians.'

Dr. Gordon Shrum told a group of engineers here 'you can't overdo something before you start doing it.'

This is a scientific age and parents and teachers must realize this, said the head of the UBC department of physics at the annual dinner of the Alberta Association of Professional Engineers.

He said the trouble with today's teachers is that they know how to teach, but not what to teach.

Canada must place more emphasis on the sciences if it wants to keep its place in the rapidly-changing world.

Russia, he said, has been placing more emphasis on science since 1917.

★ NEW YORK — A huge electronic computer has catalogued all words in the fabulous Dead Sea scrolls to bring their translations and interpretation years closer.

Nearly 30,000 words in the non-biblical frament of some 500 to 600 scrolls were indexed by alphabet, by their position in the fragments, by the words that precede and follow them and by characteristics as they appear on the scrolls—such as rubouts, insertions and omitted letters.

It will permit scholars to make highly probable guesses as to missing or unreadable words and gives them ready reference to word contexts.

The scrolls provide the oldest known text of the Bible.

—International News Service

The Letters Translated

James Reston, Washington correspondent of the New York Times, runs the Eisenhower-Bulganin letters through Uniquack, the big electronic truth-detector which is operated by the Society for the Exposure of Political Nonsense.

WASHINGTON—At the request of several baffled citizens the Society for the Exposure of Political Nonsense met here this week and ran the Eisenhower-Bulganin letters through its big electronic truth-detector, Uniquack.

The 1958 model of Uniquack looks like a cross b e t w e e n a Volkswagen and a juke box and can now translate, decontaminate and summarize w o r d y official documents briefly, c l e a r l y and truthfully:

Dear Mr. President:

Nikita and I think you should come over here one of these days for another talk.

We want you to abandon your air bases a r o u n d the Soviet Union. We want you to take your troops out of Europe, leave the Middle East, recognize Communist China and stop the trade war. Isn't that reasonable?

With malice toward none and charity for all, as Lenin said, I am

Yours faithfully,
Bulganin.

P.S. Don't bring Dulles.

Dear Mr. Prime Minister:

Thank you for your f r a n k letter. I have my doubts about the value of another talk, but I will say this: If you will get out of East Germany and leave us with our atomic bombs in West Germany to see that the West Germans behave, I think it might be useful to have another little chat.

Please compose yourself about our 274 bases in Europe, the Middle East, Africa and Asia. They are entirely defensive.

Sincerely yours,
Dwight D. Eisenhower.

P.S. When are you going to get out of Eastern Europe?

Dear Mr. President:

Nikita thinks I should write

Reprinted from NEW YORK TIMES.

you again, because some of the newspapers in India didn't give my first letter a very good display. I thought I detected a note of skepticism, even of suspicion, in your reply. Therefore, as an evidence of our good faith, I propose the following compromise:

1. Stop all atomic testing.

2. Turn all of Germany, Poland and Czechoslovakia into a zone free of atomic weapons.

3. Abandon the North Atlantic Treaty Organization, which you need, and also the Warsaw treaty organization, which we don't need.

This would assure us of maintaining our lead in atomic missiles, leave all of Western Europe within range of our intermediate missiles based in the Soviet Union and leave the Western Europeans free to develop their national culture without outside interference or the terrible financial burden of armaments.

Nikita joins me in wishing you well. Incidentally, he's on the wagon.

Yours faithfully,
Bulganin.

P.S. By the way, that was a nice little satellite you put up the other day.

Dear Mr. Prime Minister:

Foster is studying your proposals. Meanwhile, I note that you have ignored my question about Eastern Europe. This is a matter of principle with me. I disassociate myself from the wicked Yalta agreements, signed by another American President, but, nevertheless, Stalin agreed at Yalta to leave the Eastern European peoples free to choose their own governments and systems.

You have observed in Hungary and Poland the feeling of those peoples for the Soviet Union. Therefore, why do you not leave them free to do as they like, as we do in Latin America sometimes?

Sincerely yours,
Dwight D. Eisenhower.

Dear Mr. President:

We are misunderstanding each other because you insist on assuming that what I say to you is actually intended for you. Nothing could be further from the truth. My words are very largely addressed to the peoples of the world who cannot think and will not read anything but headlines.

Nevertheless, Nikita wants you to come over and talk to him and

what Nikita wants I want. (I'd like to talk to you privately about this some time). After all, you insisted on going to the NATO meeting in Paris, on the ground that what Foster could do you could do better, and that's all I am saying. Let's get together and talk.

Faithfully yours,
Bulganin.

Dear Mr. Prime Minister:

You must not misunderstand me. I rather like talking. I also like to talk about talking. It is action that is such a nuisance. Therefore, I do not rule out a summit meeting, though of course we have to be careful and I therefore do not rule it in.

My thought is that our Governments should study all these matters at the working level before reaching the summit or nonworking level. We must be prudent. Have you ever thought, Mr. Prime Minister, of the possible consequences of our reaching an agreement? What would you do without this l i v e l y correspondence to keep you busy? How would Nikita survive his agricultural and housing problems if he could no longer blame everything on Foster Dulles? All these things must be carefully considered.

Sincerely yours,
Dwight D. Eisenhower.

P.S. Is Nikita really on the wagon?

—James Reston

★ WHAT'S NEW on the recession? Well, this week (April 14) unemployment will probably reach 5.5 million. Signs of recovery which Eisenhower predicted for March aren't yet visible to the naked eye, but he postpones drastic action. Short of omniscience nobody can say, positively, he's wrong, but in view of the record on other matters one has deep misgivings. In fact the Washington scene today engenders maddening frustration — over Sputnik, nuclear tests, school aid, the Summit Conference. The Administration drifts in a Washington opium. As to economy — well, the Administration seems more afraid of inflation in 1960 than of 5.5 million jobless in 1958. *—T.R.B. in New Republic*

★ NEW YORK—How long will the recession last? That question was uppermost in the minds of businessmen, wage earners and housewive as most key indicators still pointed lower.

Eisenhower administration leaders continued to talk confidently of a probable pickup around the middle of the year.

But overshadowing all rosy forecasts was one harsh fact that no amount of statistical research could alter. For the time being, at least, the consumer had lost the urge to splurge. *—Associated Press*

The Tools of Society

A review by Carl Dreher of ENGINEERING IN HISTORY, *written by Richard Shelton Kirby, Sidney Withington, Arthur Burr Darling and Frederick Gridley Kilgour and published by McGraw-Hill. Mr. Dreher is an engineer and author of a recent book on automation.*

THORSTEIN VEBLEN envisioned economics as the bridge between social and technological evolution. One difficulty has been that 'the guild of theoretical economists' has shown little taste for technology—Veblen himself, Schumpeter, Marx, Engels and the editors of **Fortune** being among the exceptions.. Another is that technological history has been a relatively neglected field. Technology is not science, thus Sarton's great work has been peripheral; for other reasons the studies of Mumford, Smiles, Burlingame, Usher and others have failed to influence economic thought in proportion to their merits. **Engineering in History**, politically uncommitted and hence leaning toward the status quo, but leaving little excuse for ignorance of technological development on the part of social scientists, may help to build Veblen's bridge.

The writing team consisted of a civil engineer (Kirby) who is also an engineering historian, an electrical engineer (Withington) with a long-standing interest in engineering history, a historian (Darling) and a librarian and science historian (Kilgour). Their book is modestly billed as 'a general introduction rather than a definitive history,' and since it spans some 8,000 years it does necessarily leave many gaps for other scholars to fill. Ten years in the making, and based largely on original sources, it has, however, mapped the terrain for later researchers and obliterated some hoary technological myths.

Engineering in History tells how the modern mechanical, electrical, electronic and nuclear world has been put together. The presentation is clear and nontechnical, without striving for effect. There are 177 illustrations, many from early original sources. Dozens of technological epics are

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compressed into a few paragraphs and the text is studded with thousands of odd, revealing facts, such as that the sand hogs in the caissons of the 1870s worked by candlelight, that our method of measuring time and angles originated in the Babylonian number system based on 60, that the death rate rose in the 19th century because improvement in pumps resulted in the increased use of nearby river water instead of upland sources. But the real value of the book is that it never loses sight of the interaction of engineering and social history.

The fall of Rome and the subsequent history of Europe is an illustration. Christianity taught that slavery was wrong. Accordingly—and also for economic reasons — many owners freed their slaves. But slaves were the only important source of power in Rome. By the time Roman engineers began to substitute water power for slave power, it was too late. Nevertheless the Christian ethic was instrumental in giving rise to power engineering. As Lynn White puts it, 'The chief glory of the Middle Ages was not its cathedrals or its epics or its scholasticism: it was the building for the first time in history of a complex civilization which rested not on the backs of sweating slaves or coolies, but primarily on non-human power.'

Without technological history, history cannot be written in accurate perspective. Nor can technological history be written without economics. At a later stage, when steam was added to water, wind and animal power, half a dozen inventors devised technologically successful steamboats before Robert Fulton. But shabbily as John Fitch, in particular, was treated by his country, the fact remains that the engines of his boats left little room for a payload. Fulton was the first to build a steamship in which the hull did more than support the power plant and the power plant did more than move the hull.

Discoveries are made by those willing and able to look for them, but among those who are able, few are willing. Engineering groups acquire a vested interest in existing technology quite as moneyed groups do and are similarly handicapped in pressing a new development. They see the obstacles rather than the opportunities. Similarly the engineering innova-

tor of yesterday not infrequently turns into the reactionary of tomorrow. James Watt, in fear of explosions, fought high-pressure steam. Edison, obstinately and ignorantly opposing alternating current transmission, played into the hands of his financial enemies. As for inter-industry struggles, sabotage is the rule rather than the exception. The Mississippi River steamboat interest, abetted by the Army Engineers, tried to have the magnificent St. Lolis arch bridge of James B. Eads torn down as it neared completion in 1873, while in England the British Electric Lighting Act of 1882 set back electric power generation in the interest of the gas lighting monopoly.

Engineering in History has little sympathy with American technological chauvinism, which antedated its Soviet counterpart and, if less strident, is equally misleading. The average educated American can hardly fail to be aware that Europeans are responsible for most of the discoveries and innovations of science and fundamental research, but he takes it for granted that we lead in engineering innovation. Even this, unfortunately, is not true except in a few cases like that of the airplane, where the genius of Wilbur and Orville Wright played a major role in original conception and application. In the more typical case of the automobile, Europeans made all the basic inventions and were in production several years before Americans. But sixty years later the United States had 75 per cent of all the motor vehicles in the world. We excel in those phases of engineering associated with terminal applications and sales.

With all the current emphasis on engineering and technology, engineers in particular should be persuaded, if not compelled, to read **Engineering in History.** One can become a successful engineer without it but an engineer will be a better human being, and almost surely a better engineer, if he knows to whom, and to what errors and agonies, he owes the tools of his trade. **—Carl Dreher**

★ GARY, Ind.—A camera called the evapograph, which actually photographs heat, is being used by the steel industry to take color pictures of the outside of a steel furnace which reveal the condition of the interior walls.

It works just as efficiently in darkness as in daylight and requires no outside source of illumination. *—Associated Press*

Let Us Save Humanity

A story printed many years ago in a popular magazine serves to illustrate the tragedy-comedy being played today by proponents of the North American Price System. Are the citizens of this Continent going to uphold the Price System or save humanity?

OVER 40 years ago a sad but humorous story, a sort of tragedy - comedy, appeared in a North American magazine. The names of the story, the heroine, the hero and the dog involved are all forgotten now, but a hasty revival of the yarn will serve to illustrate the absurdity of a modern and more realistic tragedy-comedy being played by the Price System apologists of today. Briefly, the old story of yesterday is this :

The hero was crazily in love with the heroine. He was also extremely fond of his dog. One day he and his dog beheld the heroine seated upon a runaway horse which was about to plunge over a high cliff into deep water. Loudly the hero commanded the dog to head off the horse. Then the dog himself became a hero, risking his own life in a fierce, successful effort to c h a n g e the wild steed's course, but his mightiest exertions were not enough to prevent serious injury both to the girl and himself. There followed a short period of hesitation — our human hero c o u l d n ' t decide whether to give first aid to his beloved girl or his beloved dog, for to do both was beyond his power. The story ended with the death of the dog, for the young man eventually decided to save the girl.

With due apologies to dogs in general for such an insulting comparison, let us compare our story dog to the Price System and the girl to humanity. Luckily for the girl, her boy friend was not a Price System propagandist, or he would never have thought of risking his beloved dog for the less-beloved girl. Today North American business, like the young fellow just mentioned, is in a position where it can try to save the girl (humanity), or the dog (the Price System). But unlike the young man, it is in no quandary concerning which must be saved.

If it can only save the poor, dear, precious Price System — to hell with unimportant humanity!

Look at the activities of the Chartered Banks of Canada in raising the interest rate on loans, or in refusing loans even to safe parties. We are told that they want to halt the boom, curb consumer spending, etc., etc. Now, the cost of living is very high; people need a lot of money for the bare necessities of life, and few would borrow money if they could avoid it. Therefore a refusal to grant a loan may cause the rejected applicant real distress. But what of it? Business thinks it will save the Price System.

Look at the wheat situation in Canada. Farmers are permitted to sell only small quantities of wheat in order to bolster sagging prices. What for? To save the Price System, but at the expense of both producer and consumer. We all know of the paradox of unsold surpluses and hungry millions.

The foregoing facts are few and recorded very briefly here. In many other ways similar tactics of 'save the dog but forget the girl' are being tried. But they will all fail. The Price System will eventually be crushed by abundance, unless it can succeed in the endless dumping and destruction of surpluses, unmindful of millions of hungry mouths and bare backs.

Technocracy has no intention of dumping surpluses, but will place them at the disposal of the consumer — first at home and then abroad. Technocracy, when it is in operation, **will** dump the Price System, and its tentacles such as politics and banks, unless these things first dump themselves.

—Rod Ritchie

★ THE POSTWAR HONEYMOON, when all you had to do to sell a car was to build one, is over. There are today 56,000,000 automobiles registered in the United States, and 91% of them are less than ten years old.

The car market would be glutted even without the recession; the crisis in motor transport consists not in the lack of automobiles but in the lack of highways to accommodate those already on the road.

Even though many signs of a recession had already appeared when the 1958 models were introduced last fall, the Big Three expected to sell approximately 6,000,000 cars this year, duplicating their 1957 record.

The drastic drop in car sales is dramatized by the current 900,000-car inventory, which has accumulated in spite of the industry's curtailment of production to less than 50% of capacity. Production for the first quarter of this year is 31% under the first quarter of 1957. *—B. J. Widick in The Nation*

The Russian Industrial Challenge

WASHINGTON — Allen W. Dulles, chief of the central intelligence agency, said that Soviet industrial progress threatens to oustrip the United States and poses 'the most serious challenge' ever faced by this country in time of peace.

Mr. Dulles described the current American recession as 'an expensive luxury' which has given the Russians a propaganda target as damaging to U.S. prestige abroad as the first Soviet Sputniks.

Speaking to the annual meeting of the United States Chamber of Commerce, Mr. Dulles made these points about the current state of Soviet economy:

In the first quarter of 1958, Soviet industrial production rose 11% higher than a year ago, while industrial output in the U.S. declined 11%.

For the first time in history, the Soviet bloc (including satellites and China) produced more steel than the United States during the first quarter of 1958.

The rate of growth of the Russian economy is increasing at a rate double that of the American economy. **—British United Press**

★ OTTAWA—The debt of Canadians to retail stores topped the billion dollar mark for the first time at the end of 1957, the bureau of statistics has reported.

Retail credit outstanding totalled $1,023,800,000 as against $981,500,000 at the end of 1956.

During the year, retail sales for both cash and credit increased: Cash sales rising by 3.2% to $9,435,700,000, and credit sales rising by 1.3% to $5,218,600,000.

—Canadian Press

★ AUTOMATION AND DECENTRALIZATION have added to unemployment. Ford Local 600, once boasting 60,000 members, is down to 28,000; Local 212 has dropped from 30,000 to fewer than 15,000, and Dodge Local 3 from 25,000 to 5,000.

The impact of automation may be pointed up another way. In 1947, 648,000 auto workers built five million cars and trucks; in 1957, 652,000 auto workers built 7.2 million cars and trucks. The increased productivity per man was largely due to automation, according to the Automobile Manufacturers Association.

—B. J. Widick in The Nation

TECHNOCRACY

NORTH AMERICA'S ONLY SOCIAL DYNAMIC

WHAT ?

★ Technocracy is the only North American social movement with a North American program which has become widespread on this Continent. It has no affiliation with any other organization, group or association either in North America or elsewhere.

★ The basic unit of Technocracy is the chartered Section consisting of a minimum of 50 members and running up to several hundred.

★ It is not a commercial organization or a political party; it has no financial subsidy or endowment and has no debts. Technocracy is supported entirely by the dues and donations of its own members. The widespread membership activities of Technocracy are performed voluntarily; no royalties, commissions or bonuses are paid, and only a small full-time staff receives subsistence allowances. The annual dues are $9.00 which are paid by the member to his local Section.

★ Members wear the chromium and vermilion insignia of Technocracy — the Monad, an ancient generic symbol signifying balance.

WHERE ?

★ There are units and members of Technocracy in almost every State in the U.S. and in all Provinces in Canada, and in addition there are members in Alaska, Hawaii, Panama, Puerto Rico and in numerous other places with the Armed Forces.

★ Members of Technocracy are glad to travel many miles to discuss Technocracy's Program with any interested people and Continental Headquarters will be pleased to inform any one of the location of the nearest Technocracy unit.

WHEN ?

★ Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers and economists that become known in 1920 as The Technical Alliance — a research organization. In 1933 it was incorporated under the laws of the State of New York as a non-profit, non-political, non-sectarian membership organization. In 1934, Howard Scott, Director - in - Chief, made his first Continental lecture tour which laid the foundations of the present nation - wide membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing.

WHO ?

★ Technocracy was built in North America by North Americans. It is composed of North American citizens of all walks of life. Technocracy's membership is a composite of all the occupations, economic levels, races and religions which make up this Continent. Membership is open only to North American citizens. Aliens and politicians are not eligible. (By politicians is meant those holding elective political office or active office in any political party.)

★ Doctor, lawyer, storekeeper, farmer, mechanic, teacher, preacher or housewife — as long as you are a patriotic North American — you are welcome in Technocracy.

TECHNOCRACY

Whatever the future of Technocracy, one must fairly say that it is the only program of social and economic reconstruction which is in complete intellectual and technical accord with the age in which we live.

—Encyclopedia Americana

TECHNOCRACY DIGEST

AUG. 58

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Our Propaganda Dilemma

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No. 169

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TECHNOCRACY DIGEST

THE ONLY MAGAZINE IN CANADA THAT IS PREPARING THE PEOPLE OF THIS COUNTRY FOR SOCIAL CHANGE.

AUGUST, 1958 No. 169

STAFF

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MILTON WILDFONG.....*Assistant Editor*
RUPERT N. URQUHART, *Assistant Editor*
ED BRODERICK.....*Assistant Editor*
JANE URQUHART....*Circulation Manager*
HELEN SLATER.....*Business Manager*

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Reorganizing a Continent

The problem of reorganizing North American society to conform with the requisites of a high-energy civilization is technological. Technocracy's design is an inevitable pattern for any area which reaches the technological magnitude of this Continent.

THE CONTINENT of North America is a social Area, having the soil, climate, resources and population to make it a self-contained and self-sustaining social unit. It also has the knowledge, the personnel, and the technology to install an efficient, low-cost operation with abundance and a high standard of general welfare for its inhabitants. What is lacking is the proper organization — an integrated, efficient, Continent-wide organization designed to produce the most for the least cost in human effort, natural resources, and energy. Trade and cultural intercourse with the rest of the world, while desirable and in some ways beneficial to North Americans, are only incidental to the operation of this Continent; they certainly are not crucial.

Before attempting to comment on Technocracy's projected reorganization of the Continent, we might try to visualize this Continental area without social organization of any kind (although we realize that such a condition could be only hypothetical). Under such a condition, each individual would be free of all social regulation as well as benefits, being a

Stamyone in The American Weekend

"Mirror, Mirror On The Wall"

truly rugged, anarchistic individual. He might be respectful of the 'rights' of others or he may be predatory and homicidal in his behavior. There would be no law or other control over him, other than the possibility of reprisal by individuals. There would be no cooperative effort and no division of labor. Each individual would have to be self-sustaining.

The very nature of human reproduction requires that humans form family or communal units for the care and protection of the children; hence, absolute anarchy is out of the question. With family life, there comes a primitive order of organization. It might be a loose, mutually-cooperative group; but more likely it would be a patriarchal (possibly sometimes a matriarchal) tyranny.

It is only a matter of social evolution, step by step, through family groups, small tribes, large tribes, confederations of tribes, and nations until we have huge populations more or less integrated under a loose sort of social organization, such as in the major nations and empires of today. This evolution, however, has been neither tranquil nor continuously progressive. It is blemished with hostilities and slaughters, as well as with massive destruction of man's works. Had there been a harmonious progression from the early family organizations to modern continental organizations, characterized by mutually cooperative endeavor and stimulated with a unified social objective, it is a certainty that the resulting accomplishment would be far advanced over anything on the earth today, and there would not have been the high cost in hardship, waste, frustration, and bloodshed that our history records. There would now be social tranquillity and an easier way of life for everyone. But social organization is a new thing for the human race, speaking in geological terms, and it has progressed slowly and painfully through trial and error plus the obstacles of human cussedness. In the end, human society may prove to be a biological failure, leaving nothing but scars on the surface of the earth to show (to the uncomprehending denizens of a new wilderness) that there ever had been such a thing as human social organization. Or human society can move on to new heights and achieve such functional harmony that it

shall endure as long as life on the earth itself.

In the course of social evolution, there have crept into it certain tendencies that have proven destructive to social organization over the long term; but, under the circumstances which fostered them in the beginning, they had survival value. One of these tendencies was that of competitiveness. This tendency developed in part from a struggle for necessities of life which were scarce. Later, competition provided more drama than did cooperation; hence, it stimulated more immediate interest among the people, so its perpetuation was encouraged. But competition set man against man and group against group until, now, it has reached the point where virtually half the world is pitted against the other half. Whatever may be said for the productive stimulus derived from competition, it can be countered by manifold examples of destructiveness spawned by it.

Another tendency has been that of acquiring property rights. This grew up naturally and gradually from the simple possession of personal items, from where it proceeded to other things, including human beings (beginning with wives and children), and eventually came to ownership over real estate, slaves, and commodities, as well as the means of production. In time, possession became a passion and a symbol of social prestige. The struggle for individual possession has underlain much of the competitiveness that has bedeviled human society. Most wars have been fought with the hope of gaining possessions, if not as the major motive, at least as a prominent secondary motive. The acquisitiveness for possessions on a large scale led to the formation of corporate structures, designed to wage massive economic competition within and against society. This trend has become so vicious that the major corporations on this Continent regard their service to society as merely incidental to their accumulation of wealth, while the customers are regarded as the 'enemy' — to be looted for all they have plus all they can borrow. Recently, most of the public domain of the United States has slipped into private hands. The struggle is now on among the economic giants for the sole ownership of the earth and all that is on it. (Incidentally,

most church organizations envisage the same goal for themselves.)

A third tendency has been that toward authoritarian power. This tendency has closed in on mankind from three directions—political, economic, and ecclesiastical. Authoritarianism among humans presumably began in the primitive family organization, where the male assumed a position of dominance over other members of the family. Later, among the early barbarian tribes, authority resided in the political chief, the medicine man, and the wealthy landowners and merchants. In order to standardize and impersonalize this Authority, each of the above groups established laws to protect its Authority. The personal authorities, then, became guardians and administrators of the law. The investiture of Authority in individuals has become rather complicated in the political and ecclesiastical fields but in the economic field it generally goes with the successful accumulation or inheritance of wealth.

We do not pretend that these tendencies were invented and consciously pursued by the human species as things distinctively human. Mankind has only refined them; they had their simple beginnings in our pre-human ancestry. Competition is strongly entrenched as a tendency among the vertebrates as a whole, with the individual struggle centering on food, habitat, and mates. Property rights among non-human animals pertain mainly to food, abodes, territory, mates, and offspring. Such rights are often vague and extend only so far as individual possession and power to defend them reaches. Seldom does the possession of trinkets occur among the lower animals, and more seldom are such trinkets protected with passion (occasionally, among dogs, for example) The struggle for authority among vertebrates is on a 'peck rights' basis, where individual strength, astuteness, and aggressiveness are the dominant factors. All of these anti-social tendencies have grown out of a struggle for food, mates, and living room. Human beings have elaborated on these tendencies and have loaded them down with complications, traditions, and regulations.

In the socializing process known as civilization, the trend has been to nullify the above-

mentioned tendencies by means of another animal tendency, known as mutualism. This tendency provides for cooperation and collective endeavor as an antidote for competition. We see it exhibited by beavers in building a dam or in blackbirds driving off a hawk from their nesting site. It discounts individual possessiveness in favor of group 'ownership.' There is respect for the food supplies, the dwellings, and the mates of others in the group. Peck rights are de-emphasized in favor of 'live and let live.' Animal species in which mutualism is prominent tend to dominate an area by sheer numbers rather than by individual fierceness; for example, lemmings, barn swallows, baboons. The tendency of mutualism is in conflict with the others, but they all co-exist in even the most cooperative of vertebrate associations.

Human societies for the past several thousand years have emphasized competition, property rights, and personal authority; and they have suppressed mutualism. The result has been continual conflict, tension, hardship, and cruelty among men and groups of men. Mutualism has not been practised with an enthusiasm since the age of savagery, except sporadically by small groups. Yet, in the future, it must become the dominant tendency in our Continental society. The other tendencies, while they will not be completely eliminated, will be much downgraded from their present status. This principle must be a paramount factor in planning for the social organization of the future on the North American Continent. A high-energy civilization cannot afford the frictional waste generated by competition for wealth and authority.

In organizing the Continent as an Area of social operations, Technocracy deals in factors of mutualism rather than competitiveness. It would abolish property rights of individuals over public property (meaning anything used by more than one individual). It would greatly downgrade authority in favor of functional capability. Technocracy highlights that old slogan of mutualism—'One for all and all for one.'

In Technocracy's design, the human effort required in operating the Continental society shall be apportioned equally among all citizens of the Continent on a

man-hour basis, regardless of the kind of function or degree of reponsibility involved. Since in a highly mechanized society there will be very little time required of each individual during his lifetime, there will be no occupational hardship imposed upon anyone. Nor will there be the phenomenon of Personages deriving their prestige from the number of toiling 'peasants' under their Authority. In general, each citizen will do that function which appeals to him or her and for which he or she is qualified. This will be part of the individual citizen's contract with the Technate. No position or function will be rewarded with greater income from the Technate.

The Health Sequence will provide complete health service, with frequent examinations, for all. Hence, the facilities for administering to the health of the population must be expanded, standardized, and modernized. They must also be organized to give equivalent service to everyone—in contrast to the class distinctions which prevail in present day health service. While the operation of the Health Sequence shall be on a 'mass production' basis. the attention given to each individual will be highly personalized; for, it will be given with reference to the lifelong medical record of that person.

In the field of education, each person shall have full and free opportunity to advance as far and fast as his capabilities will permit. Education will be administered through a centrally-controlled Continent-wide system, with a standardized curriculum, and with standardized presentation and testing. The petty politics of local school boards and the inconsistencies and differentials of the present educational 'system' will be eliminated; there will be no private or parochial schools. Further, the emphasis will be placed on the objective factors in our society rather than on philosophy and tradition.

The tendencies of competition, possession, and authority will find their play in avocational fields rather than in the management of social affairs. No doubt, there will be cults of artists, authors, philosophers, gardeners, and sports enthusiasts wherein competition (non-commercial) shall appear; where a sort of possession can be achieved, albeit one which re-

flects individual achievement rather than mere buying capacity; where authority among one's peers can be gained, either through keeping ahead of others by superior accomplishment or by climbing the ladder of a synthesized reputation. (We anticipate no basic change in human nature, only modifications in human behavior arising from a change of environmental and social circumstances.)

Competition for wealth and authority is far too wasteful and hazardous to be permitted in a high-energy civilization. In spite of its cruelties and repressions, competition could get by in past societies; for, the rate of dissipating the natural resources under human-toil, hand-tool techniques was so slow that it took centuries or milleniums to devastate an area. But, with modern technological methods of harvesting resources, along with the incentives of bonanza exploitation, a high energy civilization would be short-lived. That fact is now being forced upon our attention the hard way.

One must take into consideration the demonstrated fact that human beings—at least a large portion of them—are never satisfied with merely having their needs supplied; they must go in for wasteful ostentation, if their economic resources permit, as a way of enhancing their personal prestige. In colloquial terms, they 'go Hollywood' or 'go Park Avenue' at the first opportunity. The free expression of this tendency must be eliminated from the social design; for, the society simply cannot afford to support such grandiose waste, especially if a large number of people are to participate in it.

The simplest way of eliminating prestige waste, and at the same time abolishing its corollary, poverty, is to program an efficient production and distribution of abundance to all citizens on an equitable basis. In this way, everyone is amply supplied with the facilities of life and enjoyment of living; none can acquire prestige from ostentation; and the natural resources can be conserved for many centuries.

Technocracy proposes that this problem be handled by the simplest and most effective of all means: It would operate the economy as a Continental unit under the control of the Continental so-

ciety. Most general services and facilities would be provided 'free' to all citizens. Special goods and services would be accounted for individually by means of distribution certificates—Energy Certificates—which would be provided in equal amount to all adult inhabitants. Thus, each person could obtain all that he or she could personally use; but no one could engage in exchange of physical wealth on an enterprise basis. All persons would have equal economic potential, hence there would be no social prestige accrue from ostentation.

One of the principal factors of social cost on the Continent today is that of transportation, both of materials and people. For the future, this cost must be drastically reduced and must be given primary attention in any plan for organizing the Continent. The least costly form of transportation is shipment by water. To a certain extent, coastwise shipping can be effected by ocean-going vessels; but far greater tonnage of freight must be moved around within the Continent away from ocean channels. For this purpose (and others), Technocracy has designed a Continental Hydrology which provides waterways to most interior parts of the Continent. Among other things, it involves deep-water transportation to the Great Lakes via the Mississippi, Hudson, and St. Lawrence Rivers (with truly deep channels and fast lifts from one level to another, not an aborted design like the St. Lawrence Seaway now under construction). Most bulk freight of the Continent would be carried by water-trains over this inland system of waterways. Also, large numbers of people, particularly children on educational excursions, could be transported in comfort on leisurely cruises about the Continent.

Next to waterway transportation, the least costly is railroads. This will be particularly so after the railroads and the railroad system are properly re-designed for increased tonnage, speed, efficiency, passenger service, and other functional requirements. Among the changes which Technocracy has designed for railroading is a three-meter track gauge . . . Because of its high cost, air transport will be limited to those things and passengers which require high-speed movement. The physical cost per ton-mile or pas-

senger-mile is too great for general use. . . Trucks and cars would be used mostly for local haulage and passenger transportation, being used much less than today for long trips. Even now, there is a trend toward carrying long-distance trucks 'piggy back' on railroad cars to reduce costs. Few people would want to drive a car across the Continent when they could travel that distance by fast train, then be able to pick up a personal car at the other end for local transportation. Personal cost would not be a controlling factor in prohibiting the using of railroad services as it is today.

The roadways of the Continent would be designed into a transportation system, with more controlled-traffic superhighways and much less mileage of secondary and tertiary roads, such as make up our haphazard network of roads today. In many places the roadway mileage would be reduced 50 to 1. Yet, at the same time, far more efficient highways transportation would be provided. A Continental system of pipelines would serve to transport gases, liquids, and suspended solid particles over great distances, while secondary systems would be used for local distribution or collection. Most power would be transported by underground, high-voltage, direct current cable. The power grid of the Continent, for transportation of energy, is another of Technocracy's designs for an efficient, low-cost operation of North America.

Another factor in the present high cost of social operations is the inefficient methods of material packaging, handling and distribution. It also entails excessive employment of human effort, although there is, of late, a growing trend toward automaticity. The packaging, the methods of handling, and the terminal facilities could be designed for automatic, low-cost operation. Technocracy has given this problem particular attention and has prepared the essential designs. According to Technocracy's plan, a freight ship could come into dock, unload, reload, and be on its way within a morning or afternoon. Likewise, railroad cars could be loaded and unloaded in a matter of minutes.

In reorganization of the Continent, one of the primary problems is that of land use. Certain areas are suitable for agricultural crops of one or more kinds. Other areas

are suitable only for forests and recreation, and these include much that is now in marginal and sub-marginal farms. Besides the reforestation and afforestation of large areas, many forest and fruit trees can be grown along the margins and in the interspaces of the highways. At present, these strips of land are largely wasted and unsightly, or when an attempt is made to improve them it is with ornamental grasses, shrubs, and trees of little or no economic use, while the upkeep is high cost.

Certain pieces of land would be flooded with lakes and ponds for water storage, transportation, recreation, and climate modification; while other areas would be drained or filled in, depending on the circumstances and requirements. The flow of some rivers would be reversed, that of others diverted into different channels or into reservoirs. Thus, the precipitation falling on the Continent would be put to maximum practical use before being allowed to flow back to the sea. Among other things, it is highly important that the water of the geological formations, which has been so heavily depleted by deep wells and pumping, be replenished — and more added. Most parts of the Continent can use much more fresh water than they normally have available; yet, they are not prepared to conserve the water which does come their way, allowing most of it to flow off and eventually become lost in the oceans.

In any plan for the Continental society of North America, the first concern must be for the people who inhabit the area. After all, it is for the people that the organizing is done. The reorganization must be in reference to the people, the number and kinds, who are here now. What are their living requirements and consuming needs; rather, what will they be under conditions of abundance? What is essential to maintaining tranquillity among them? How can their welfare by effected with a high degree of efficiency and minimal cost?

While Technocracy is not a reform movement and is not involved in a philosophy of 'brotherly love,' it does provide for the elimination of most causes of human distress, such as poverty, illness, toil, insecurity, and frustration. Even in the Technate,

there will be people with personal problems and worries, but these problems won't be of an economic nature. No one will want for a place in which to live, or for clothing, or food, or transportation, or health care. One will be more or less burdened, however, with the problem of what to do with one's own self—with finding some interest or activity to give zest to living. We say 'm o r e or less,' since, for those of little imagination or creativeness, there will be m a n y kinds of stereotyped activities available to absorb one's time and interest, ranging from bridge and c h e s s to mountain climbing or boating, and from exhibition dancing to reading of classical literature. But opportunities for 'getting ahead' by gypping the other fellow will be nil. One will have to rely more than e v e r on personal qualities and achievements for gaining recognition.

The problem of reorganizing North American society to conform with the requisites of a high-energy civilization is not a political problem, nor is it a moral problem; rather, it is technological. It involves a realignment of the physical factors of the environment so as to provide the most in the way of goods and services for the longest time at the least cost in energy, scarce materials, and human effort.

The design of Technocracy is an inevitable pattern for any area which reaches the technological magnitudes of the North American Continent. Other continents, should they reach the same magnitudes, would have to consider a similar design for their areas. There can be no retreat into any of the classical social forms of the past. A new design to fit a new and unique situation must be applied. The design developed by Technocracy is so appropriate, so fool-proof, so technologically correct, and so beneficient to the population of North America that one may wonder why it was not adopted with o p e n enthusiasm long ago. The a n s w e r can be summed up in two words which apply to human behavior characteristics: 'inertia' and 'cussedness.'

Many people may claim mitigating circumstances on the basis of ignorance or misinformation regarding Technocracy; but such excuses are mostly for the birds and morons, for, considering what is at stake and considering the

amount of publicity which Technocracy has attracted over the past 36 years, we cannot accept such blase innocence. The basic reason is still inertia or cussedness. It may be true that some people have not heard of Technocracy due to illiteracy or preoccupation with other things, but that does not entitle them to special consideration; they are too socially inert to be impressed with new ideas anyway. They are no different in their social response from the millions who have heard of Technocracy and who still behave toward it with inert indifference.

Unfortunately, the advent of Technocracy depends to a large extent upon a few thousand more people becoming sufficiently disillusioned in their attempts to beat the Price System game to demand a change. By 'change,' we do not mean a shift within the patterns of the status quo, but something fundamentally new and different. On the Continent of North America, a shift to socialism is not enough. The only change that has any meaning is a change to the technological social pattern of Technocracy. When that change is effected, the people of North America can set about reorganizing their Continent for their mutual welfare—not a 'welfare state' but a technological social design.—**Wilton Ivie, CHQ**

★ TOKYO—Red China is pouring goods into the arc of nations from Pakistan to North Viet Nam.

China's Southeast Asia exports were virtually nil after the mainland fell to the Reds in 1949. They rose to $329,000,000 in 1955 and $319,000,000 in 1956.

Now there is evidence exports are headed for a new high under a spectacular sales drive. China is offering the easiest 'buy-now-pay-later' financing ever seen in Asia and mail order procedures that built merchandising empires in America.

The principal immediate targets seem to be Indonesia, Malaya and Singapore—all with substantial portions of the 13,000,000 Chinese scattered throughout Southeast Asia's 15 nations and colonies.

Britain's trade has been hurt badly. Japan, too, is deeply concerned. Its goods are being undersold 10 to 15% in an area it has always considered the greatest potential source of raw materials for its industries. —*Associated Press*

★ OTTAWA—More businesses went on the rocks and defaulted on greater liabilities during the third quarter of 1957 than in the corresponding period of 1956.

The bureau of statistics has reported that business failures under the Bankruptcy and Winding Up Acts rose 13% to 512 in the third quarter of 1957 from 454 in the same quarter of 1956.

Defaulted liabilities soared 62% to an estimated $20,351,000 from $12,596,000. Average liability per failure rose 43% to $38,700 from $27,700. —*Canadian Press*

The Miracle of Rivers

The author of this article, Richard L. Neuberger, U.S. Senator from Oregon, has specialized as a writer and legislator in the field of conservation and water-resource development. He serves on the two major Senate committees concentrating in these fields.

MEN HAVE BEEN fascinated by the miracle of rivers ever since the early origins of the human race. Primitive tribes traveled on rivers in crude dugout canoes, and dragged fish from the swift riffles of these rivers. When mankind had advanced farther from the cave, rivers were used to turn wooden wheels which ground grist to flour. But fields of wheat in many realms of the world needed water for irrigation, before this grain could grow. So the massive strength of rivers was tapped to move still larger wooden wheels in order that water from these rivers could be deposited on furrows which required such life-giving succor.

In the sunrise of history, men of course knew nothing of the unseen giant of hydro-electricity, which lurked wherever a river foamed over a precipice or shot through slanting narrows. Even the later frontiersmen and pioneers in buckskin were unaware that in every waterfall hovered a source of fuel mightier and more enduring than any yet discovered. But, as boundaries were laid down, it became more difficult to put these rivers to full and untrammeled use. Boundaries, after

Herblock in The Washington Post

"All He Wants Is Just That Little Switch"

Reprinted from THE PROGRESSIVE.

all, are made by men. In this same category are such institutions as passports, customs duties, tariffs, and doctrines like states' rights or national sovereignty. But rivers recognize none of these artificial or synthetic lines. Their destiny has been shaped by geography rather than by resolutions or treaties.

Snow falls perennially in the mountains and forms icefields and glaciers, which melt in the midday sun. Rivulets seep through the glacial moraine and merge. Where they merge, a creek takes form. Innumerable creeks find their way downhill, through chasms and ravines. They disappear over cliffs in rockets of spray, but take shape again in icy pools at the bottom. When the snowbanks are melting, the mountains trill and echo to the clamorous sound of falling water.

Like capillaries uniting to create a vein or artery, all the creeks and brooks from the highlands finally blend in some gorge of awesome depth and proportions. Eventually, the ramparts of the gorge soften into the timbered slopes of wide valleys. The river, released from its rocky prison, widens into a broad swath as it seeks the distant ocean.

This has nothing to do with state or national boundaries. Instead, it submits to sublime natural processes, by which dense forests permit precipitation from snow and rain to flow to the sea. Theodore Roosevelt, that militant 26th President who loved the outdoors, may have been the father of the TVA idea because he understood the phenomena of nature, where the birth of great rivers occurs. He said to Congress half a century ago, in 1908:

'Every stream should be used to its utmost. No stream can be so used unless such use is planned in advance. When such plans are made, we shall find that, instead of interfering, one use can often be made to assist another. Each river system, from its headwaters in the forest to its mouth on the coast, is a single unit and should be treated as such.'

This is the hard core of the TVA idea. It is as simple as that. It sprang from the mind of a progressive Republican President. Nearly three decades later, his distant cousin, a liberal Democrat named Franklin D. Roosevelt, put it into practical effect in the

watershed of the Tennessee River. The link between the reign of these two Presidents was a mild, tenacious U.S. Senator with snowwhite hair and a valiant soul who knew them both—George W. Norris of Nebraska.

Water, of course, is virtually inexhaustible. Rivers replenish the ocean, and water from the ocean is sucked into the heavens and dropped as snow and rain on the mountain ranges, where rivers are cradled. This process was under way epochs before Neanderthal man. It will still continue, even if man manages to destroy himself with Strontium-90 and hydrogen weapons. It is eternal.

I stood looking at Bonneville Dam with former Secretary of the Interior Oscar L. Chapman. 'Dick,' he said, 'that is an oil well which will never run dry, a coal mine which will never thin out.'

In every river that rushes downhill, the same water can be used to float boats, irrigate land, generate power, and provide habitat for fisheries. Within these categories, there are subdivisions. 'Boats' can mean a family's aluminum canoe or a throbbing diesel tug hauling half-a-dozen barges loaded with petroleum or wheat. The reservoir behind a dam can provide swimming for many, and at the same time it can prevent disastrous floods from inundating great cities far below on the coastal plain A river never sleeps.

When Franklin D. Roosevelt sat in the White House, his political enemies charged that he hoped to establish a TVA on the Danube. The suggestion is no longer a political canard. The Eisenhower Administration, while indifferent to the TVA which Franklin Roosevelt developed on the Tennessee River, has talked frequently of advancing American funds for a TVA on the legendary River Nile, so that Egypt can become a land of industry and prosperous farms. Friends of that outpost of democracy in the Middle East, Israel, speak hopefully of a TVA on the Jordan River, where the Scriptures were written. Before China was taken over by the Communists, many Americans predicted that this ancient nation might be rehabilitated by a TVA on the Yangtze.

Yet the TVA idea is not exclusively for export. Despite the coolness of his regime to federal

power development generally, President Eisenhower quoted from Theodore Roosevelt's statement about each river system being 'a single unit' when he signed the bill in 1955 authorizing a costly network of storage dams on the upper reaches of the Colorado. In the river basin of the greatest hydro-electric resources, that of the majestic Columbia, many bipartisan groups today are calling for a Regional Power Corporation that would be extensively modeled after the TVA self-financing act, approved by the Senate last summer. A leading advocate of such an undertaking is Oregon's traditionally-Republican newspaper, the **Oregonian**, which not long ago called attention to the fact that 'as of June 30, 1957, Congress had appropriated approximately $1.8 billion for all (federal) power projects in the Columbia River system. And as of that date, $226 millions has been returned to the Treasury to apply on the principal, nearly $80 million ahead of schedule. Interest paid on the government funds was $161 million. This does not take into consideration, of course, the tremendous cash benefits accruing to the government through increased taxes paid by individuals and industries which depend on federally-generated power.'

Need there be any more conclusive evidence that federal investment in great rivers is just about the safest, most solvent expenditure made by the U.S. government?

Nature was generous in endowing America with rivers. They rib out the continent from sea to shining sea. Many of them await the kind of unified development symbolized by the TVA, the integrated program which Theodore Roosevelt had in mind when he spoke of treating as a whole 'each river system, from its headwaters in the forest to its mouth on the coast.'

Five major watershed areas, scattered all the way across the nation, are most susceptible to this kind of treatment. They are:

1. The Columbia, in the Pacific Northwest.

2. The Sacramento, Feather, and San Joaquin, in California.

3. The Colorado, in the Rocky Mountains.

4. The Missouri, on the Great Plains.

5. The St. Lawrence, in the Northeast.

Two of these magnificent waterways are involved in international negotiations. They are the Columbia and the St. Lawrence. I recently toured the St. Lawrence Seaway, where a 27-foot navigation channel is being tooled from the Atlantic's waters to the Great Lakes. At Barnhart Island, some two million kilowatts will be a collateral benefit of this undertaking. Through authorization by Congress, the New York State Power Authority will tap some 1.8 million kilowatts by drawing off water above Niagara Falls under cover of darkness, when the scenic spectacle will not be jeopardized. The water then will be dropped into the Niagara Gorge through huge penstocks during the daylight hours, when low-cost energy is most needed to move the wheels of industry.

The St. Lawrence Seaway is a joint undertaking of the United States and Canada. After years of delicate negotiations, the obstacle of the international border at last has been overcome. The cost of the St. Lawrence Seaway is about $1 billion, with some $300 million invested in the navigation improvements and the rest in the colossal power plants. Yet here, as in the TVA itself, revenues from the sale of hydro-electricity will eventually help to finance the entire undertaking, although tolls also will be collected from the freighters which ply between the Gulf of St. Lawrence and such great new inland 'seaports' as Toronto, Chicago, and Milwaukee.

No such happy and beneficial use of the Columbia River on an international basis can be reported, although the same pair of countries share it. Yet upstream storage reservoirs on the main stem of the Columbia, in Canada, could add the equivalent of four extra Bonneville Dams to federal generating capacity in the United States—to say nothing of far more kilowatts north of the border in British Columbia. These reservoirs have not been built because unified development is lacking.

While Franklin D. Roosevelt and his successor, Harry S. Truman, were in the White House, exactly 20 multi-purpose projects were approved for the Columbia Basin. Five years ago this policy underwent an abrupt change. No multi-purpose projects have been

authorized for construction by the U.S. government since 1953.

What is a multi-purpose project? It is a project which symbolizes the Theodore Roosevelt concept that a river system surges from alpine meadows to the ocean as a unit. Thus, the same dam of concrete and steel can (1) store water to retard or prevent floods, (2) drown out rapids which impede navigation, (3) provide locks to get tows and freighters past the dam itself, (4) pump some of the stored water to irrigate arid land for agriculture, and (5) generate vast quantities of hydro-electricity which will produce enough revenue to amortize the cost of the whole undertaking —principal, plus interest.

Throughout the United States, this concept is urgently necessary today. On the silt-laden Colorado River, which men once described as 'too thick to drink and too thin to plow,' it is needed to provide water for thirsty Los Angeles and for potentially-fertile valleys in the distant uplands of Utah, Wyoming, and Colorado. In the vast Central Valley of California, it is needed to transfer water from the snow-cushioned mountains of the north to orchards and lettuce fields parched for lack of irrigation in the south. On the sluggish Missouri, it is needed to level off floods and to improve navigation far into eastern Montana.

Everywhere in these river valleys, men cry out for the beneficial use of water which is now going to waste or even wreaking harm. They seek unified development, although some shun the controversial initials 'TVA.' But regardless of the initial or appellation applied, a dam by any name is a dam just the same. And now a new and compelling reason exists for harnessing the magnificent rivers by which America pours its tribute of snow and ice and rain to the eternal oceans. That reason is the sweeping program of unified development presently under way on stupendous rivers of the Soviet Union — one of the dramatic stories of this century.

In examining that story we should first understand that our own nation is not alone in possessing rivers of truly great magnitude. General Emerson C. Itschner, chief of the Corps of Army Engineers, has pointed out the sobering geographical fact that of American rivers only the Colum-

bia 'begins to compare with the four major rivers in Siberia' in hydro-electric capacity. 'The St. Lawrence has quite a large hydro capacity, but aside from that, the other rivers do not have a very large amount,' General Itschner said. The Columbia alone carries in its waters 40 per cent of our nation's total hydro-electric capacity.

In the famous interview with Khrushchev on the CBS **Face the Nation** television program, the top man of the U.S.S.R. said: 'We declare war on the United States in peaceful production . . . We will win over the United States.'

Khrushchev knows that the four major rivers of Siberia — as well as the other great waterways of his country — could be heavy artillery in that rivalry. Energy reserves may shape the destiny of world conflict, because all industrial output rests ultimately on units of energy. Coal mines wear out, and miners decline to work underground. Oil wells eventually run dry; already it requires at least 20 times as much drilling in Texas to bring in a single barrel as it does in the Middle East. Uranium may be the fuel of the future, but how does mankind dispose of waste material which can inflict cancer of the bone on future generations? A single rampant barge of this sinister sludge terrorized shipping on our Eastern seaboard.

But a river flows on forever.

In the last budget prepared by President Truman, the United States government spent on all its federal power undertakings— TVA, Columbia River projects, Bureau of Reclamation, Southwestern and the Southeastern Power Administrations -- a total of $681 million. By the fiscal year of 1957, under the hostile spell of the Republican residency at the White House, this sum had dwindled to $316 million.

But while the U.S. government was cutting in half federal investment in the development of its rivers, Soviet Russia accelerated a program headed in the opposite direction. Details of this program were described to the Senate Interior Committee by three qualified men, while fellow members and I sat in fascination. The tale was told to us by General Itschner, who, as chief of the Army Engineer Corps, is responsible for the bulk of our federal river projects; by Senator Henry M. Jack-

son of Washington, who visited Russia in 1957, and by Senator Allen J. Ellender of Louisiana, who has toured the Soviet Union for each of the past three years and who, in 1957, had the opportunity of seeing remote areas in Siberia never before visited by an official of the U.S. government.

After these presentations, I felt certain that no more profound mistake could be made by us than to neglect the wise use of America's rivers. I felt equally sure that, if all the people of our land could have heard what was said by these three men, there never again would be a concerted voice raised in opposition to such undertakings as the TVA, Grand Coulee and Bonneville Dams, the St. Lawrence Seaway, the proposed high dam at Hells Canyon, or a river pact with Canada on the foaming reaches of the upper Columbia.

Declared General Itschner in summary: 'The Soviet water resource is demonstrating to the world what can be done in this field by well-considered, long-range planning and a willingness to make sacrifices in present standards of living in order to achieve the goal of a great future industrial development. Indeed, the Soviets have given water-resource development a priority second only to the development of heavy industry designed to support military programs.'

More than 40 river projects are under construction in Russia. Four of them will be the mightiest hydro-electric plants ever built. They are:

1. Krasnoyarsk Dam, Yenisei River, 4,004,000 kilowatts.

2. Bratsk Dam, Angara River, 3,340,000 kilowatts.

3. Stalingrad Dam, Volga River, 2,350,000 kilowatts.

4. Kuibyshev Dam, Volga-Samara Rivers, 2,100,000 kilowatts.

By way of contrast, the largest power plant in America is Grand Coulee on the Columbia River—until now, Number One on earth—whose capacity is 1,944,000 kilowatts—less than any of the four Russian giants, and less than 50 per cent of that of the fabulous project rising across the Yenisei River in Siberia. And there would not even be a Grand Coulee in the United States today, if the Washington Water Power Company had been as successful in its opposition a quarter of a century

(*Continued on Page* 31)

RESEARCH BULLETIN

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Towards Automation In Surgery

A TEAM OF CANADIAN surgeons and engineers has developed an instrument that will replace, in most cases, the present method of reuniting blood vessels with needle and thread.

This 'vascular suturing apparatus' is, in effect, a modified stapler consisting of two clamps to hold interchangeable split bushings and of a handle to manipulate the clamps.

To make a suture, simply follow these instructions: remove the the damaged section of the blood vessel; thread end of vessel through one of the bushings; 'evert' the vessel (turn it inside out, so as to form a cuff over the bushings); feed the arterial graft, which is to replace the section removed, through the other bushing; 'evert'; lock the two clamps holding the bushings in their jaws, which will then be accurately aligned; squeeze handle manipulating the two clamps, which will then drive the staples through both walls of the vessel and clinch them; release handle, which in turn releases both clamps at once and allows the split bushings to fall away; recover split bushings; roll one cuff of vessel neatly over the other. You have now

completed, within about a minute, a blood-proof 'arterial anastomosis' (joining together of blood vessels) that might have taken hours if performed by hand.

Naturally, many complex problems had to be solved before an instrument could be designed that was as easy to build, simple to operate, reliable, and versatile.

(1) Versatility was increased by using interchangeable sets of bushings of varying diameters, to fit a wide range of blood vessel sizes—even those of less than 5 mm. diameter, where hand sewing is impossible.

(2) The U-shaped staples, made of tantalum, had to be specially designed and their points had to be machined with exceptional care; for they had to clinch smoothly at a predetermined thickness so as to keep the vessel free from internal protuberances.

(3) A mechanical aid had to be developed so that the 'cuffs' of the vessels could be rolled over the bushings neatly and quickly; for only when the inner surfaces of vessels are touching each other ('apposition of intima to intima,' as the doctors call it) will the graft 'heal in' properly.

It took about two years to develop and test the instrument; it is now being patented by Canadian Patents and Development Limited on behalf of the inventors; after further familiarization trials, it is expected to be ready for licensing to a manufacturer.

I. J. Vogelfanger, M.D., and W. G. Beatty, M.D., of the Department of Surgery, Ottawa Civic Hospital, who are the driving force behind the development of the 'vascular suturing apparatus,' are the authors of an article in the **Canadian Journal of Surgery,** (Vol. 1, No. 3, April, 1958, pp. 262-265), which describes the instrument in detail for the first time. A quote from the discussion may best serve to illustrate the potential impact of the device on surgical technique:

'Dependence on manual skill, which is limited, and failure to to supplement it by a mechanical device prevents surgery from implementing progressive ideas in medical research. The introduction of the principle of automation into surgical technique can make the difficult easy and the impossible an achievable reality. The instrument

described above serves as an initial step in the application of this principle and promises advances in scientific, clinical and defence problems.

'Mechanization exceeds the realm of human skill and opens new horizons in physiological research through experimental surgery.

'In the unexplored field of small vessel anastomosis, the mechanical device combines the advantages of speed and high precision, with the elimination of the unavoidable trauma associated with prolonged manual effort.'

Even the 'Acknowledgements' are well worth quoting: 'The authors wish to thank Mr. G. Klein, Mr. A. Smialowski, and Mr. G. Fisher, of NRC's Division of Mechanical Engineering, . . . Dr. P. J. G. Plummer and his staff of the Animal Disease Research Institute, including Dr. D. Mitchell, Dr. J. Howell, Mr. D. Heyland and Mr. W. Conroy, . . . and Dr. D. Cockburn, Dept. of Radiology, Dr. J. Patton, Dept. of Pathology, and Mr. M. Smith, Dept. of Photography, Ottawa Civic Hospital . . . (and) Dr. Charles Mitchell of the Defence Research Board . . .'

Truly, a monument to the tremendous amount of teamwork, without which this new device to save lives and limbs could not have been developed. **—National Research Council News**

Cooling With No Moving Parts

ELECTRICAL APPLIANCES that cool—as well as heat—without any moving parts have moved a step closer to consumer markets. Westinghouse Electric Corp. recently demonstrated two new heating-cooling devices :

A battery-operated hostess cart that refrigerates food in one compartment, warms it in another. Estimated price: $300.

A baby-bottle warmer-cooler with an automatic timer. For a set time, it keeps the bottle refrigerated; then it reverses the current and heats the bottle to the correct temperature for feeding. Estimated price: $50.

In electrical appliances, the heating ability is nothing new — electrical heat normally comes from the resistance of metals to a current. But to cool without the motors and compressors that conventional refrigerators require is something dramatically new.

New Horizons — The practical success of the new family of appliances hinges on semiconductor materials, a group that has only been studied intensively in recent years (transistors came from such studies). Using semiconductors makes possible practical application of an old electrical phenomenon; and the heating effect comes either as a by-product of the cooling effect or from reversing the electric current.

Absence of moving parts cuts down their bulk (the new units need only about half as much space as if they had conventional refrigerating machinery) and lets them operate on less power (60 watts for the bottle warmer and 150 watts for the hostess cart). They also have virtually nothing to wear out.

At today's estimated prices, the two Westinghouse appliances are expensive novelties, and Westinghouse people are careful to speak of them only as experimental products. But they open up new vistas in the appliance market.

'This is even bigger than the transistor breakthrough, in terms of the end-use appeal of its products,' says Chris J. Witting, the company's vice-president in charge of consumer products.

Really Portable—At first, portability will be the major selling point of the new items. The cart works on a battery, rechargeable from house current; the bottle warmer, on an automobile's electrical system (plugged into the cigarette lighter socket) or, through a rectifier, from house current. All of the new-type appliances will need direct current.

Their freedom from ordinary house current makes the first two Westinghouse appliances attractive for travel or summer camping, for use on the backyard terrace or at the beach. But the same principle can be applied to household refrigerators, freezers, air conditioners, and spot coolers, either for economy of operation or for new cooling devices such as refrigerated cocktail shakers, photo developing trays,

and drawers for storage of food, furs, or woolen clothing. With their compactness, they could be scattered around the house.

Working on It—Several years ago, Radio Corp. of America demonstrated a small refrigerator that works on the same principle as the Westinghouse appliances. RCA says it is still working on the project, but progress has been shrouded in corporate security.

Basically, the RCA device works on the same principle as the Westinghouse appliances.

Old Idea—When you ran an electric current through metals, you expect the metals to heat up. But the opposite happens in the Westinghouse cooling elements—the metal cools off. The principle is startling to laymen, but it has been known to scientists for more than 125 years.

In 1826, Thomas Johann Seebeck discovered that when two wires of different metals were connected in a loop with two junction points, electricity would flow through the wires if the two junction points were kept at different temperatures. This thermoelectric effect has since been put to wide use as a temperature measuring device called a thermocouple.

Eight years after Seebeck's discovery, Jean Charles Peltier of France discovered the obverse of the theory. He found that passing a current through the junction points of two metals—bismuth and antimony—caused the junction to cool. Reversing the current, he found, reversed the effect, warmed the junction.

However, the temperature differences were slight, and Peltier's contribution to knowledge remained a scientific curiosity until the development of modern atomic theory and the advent of semi-conductors. One limitation on achieving a sharper difference in temperatures between the two dissimilar metals was that any known connecting materials that carried electricity well also carried heat well—so the heating at one junction canceled the cooling at the other.

Providing the Key—But some semiconductors are good conductors of electricity but poor conductors of heat. With materials chosen from this group, it may prove possible to raise the efficiency of the standard refrigerator from its 10% to 12% rating today to perhaps

as high as 50%. At the moment, the Westinghouse devices have an efficiency only about the same as conventional refrigerators. But scientists see no mechanical limitation on the improvement of their efficiency.

Westinghouse won't say exactly which semiconductor material it uses in its new appliances. In its electrical circuits, it is the semiconductors that are different, rather than the metals that connect them. Thus, copper bars or plates on one side of the circuit are cooled by the passage of electricity while the other set is heated.

In the hostess cart, the cool side of the circuit takes care of the refrigerated compartment while the hot side serves the food warmer. In the bottle warmer-cooler, a single element cools or heats, depending on which way the electricity flows.

Some experts are guessing that the Westinghouse semiconductors are of the intermetallic type, which includes such compounds as lead selenide, bismuth telluride, and some of the carbides. Since low heat conductivity is needed, it may be, too, that Westinghouse has come up with a ceramic type of semiconductor. **—Business Week**

Russia's Economic War Hurts

NEW YORK—Russia's economic war with the West is beginning to hurt a little in at least one sector. World metal markets have been jolted a bit by Russian exports.

Aluminum, tin, platinum and zinc as well as some of the steel alloys have felt the competition. And some of the price weakness in these metals is traced to an outpouring of Russian metal, especially into Western Europe.

The Russians can set their own prices—usually below the prevailing world price—because Soviet bookkeeping isn't hampered by such things as the cost of production or the need to break even or better.

There's no way of knowing Moscow's intentions: Whether Russia simply is producing more now and wants to sell surpluses to get funds needed for purchases of Western goods, or whether it is dumping the metal with a view to upsetting the world markets and thus adding to whatever effect the American recession is having on Europe.

But Nikita Khrushchev boasts he will take world markets away from the United States and the flurry in metals may be the first of these economic brush wars.

How Russia can affect American domestic markets first came to light by way of Canada. Russia was putting so much cheap aluminum into England that Canada was losing her big market there for the metal. So a Canadian producer cut the price of aluminum. A few days later American producers were forced to follow suit.

The price of platinum was dropped here. The reason given by the trade is that Russia is selling the metal in Europe at cut prices and the competition must be met.

United Nations officials report that Russia now is entering the world markets as an exporter of tin. Other countries—Belgian Congo, Nigeria, Bolivia, Indonesia, Malaya and Thailand—have had this market to themselves.

Already the price structure of the metal is weak and production in the non-Communist world cut back so that the new competition is disturbing. The United Nations reports that last year the Russians exported 6613 tons of tin to Western Europe for about $15,000,000, compared with only 346 tons the year before. Some put current exports at 10,000 tons.

From time to time Russian gold shows up in Western Europe. Probably the gold is used merely to buy things the Russians need badly, but often one or more of the European currencies are under such pressure from other factors that the sudden change in the volume of gold on the market can be upsetting.

Russia's gold production figures are secret. But some estimate that it is producing around 17,000,000 ounces a year, or the same as South Africa which is the largest producer in the Western world.

—Associated Press

New Electronic Brain

WASHINGTON, D.C.—The U.S. Navy has announced the partial development of an electronic robot it says will be able to match some of the functions of the human brain.

It calls the robot a 'perceptron.' At least another year will be required to complete the first full pilot model, the Navy said, but its principle and concept already have been demonstrated successfully by using a large electronic computer.

When it is fully developed, the machine is expected to be able to perceive, recognize and identify its surrounding without any human training or control. It differs from the ordinary computer in that it does not have to be fed facts and figures in advance.

Among the potential uses to which such a robot eventually may be put, the announcement said, are these:

Automatic landing systems and automatic pilots for aircrafts; automatic reading of printed or written words; responding to verbal commands; automatic language translation, either in written or vocal form; automatic unearthing of information buried in library books, and recognition of musical compositions.

The Navy says the system closely parallels, by electronic means, the 'selective recognition of "similarity" function of man's mind.'

It would operate in much the same way that the eye and certain brain areas work together to provide the human function of recognition.

—Associated Press

★ GREENWICH, Conn.—A fully automatic candy-making machine has been put on the market by a Greenwich firm.

Operated by a panel like that of a telephone switchboard, the machine can turn out as many as 20 types at once.

It manufactures, decorates and even packages its varied products—which include hollow chocolate rabbits and turkeys—with the mere touch of buttons.

—Associated Press

★ STOCKHOLM—A new electronic computer-microscope that automatically computes the age and annual growth of trees has been developed by Swedish scientists.

When a core of wood from the tree is fed into the machine, it counts the concentric rings and also measures the width between them.

The invention was described at the annual meeting of the Academy of Agricultural Sciences in Stockholm.

—Reuters

(*Continued from Page* 22)

ago as the Idaho Power Company has been in our own time, in seeking to block the great Hells Canyon project on the Snake River along the Oregon-Idaho boundary.

In hydro-electric development, according to General Itschner, 'the Soviets already approach us in total installed capacity and have individual projects under construction that far exceed any American project in capacity.'

For many years, American engineers predicted that Russia's brutal winters would make impossible any successful water-power projects on rivers which freeze as hard as granite nearly five months of the year. 'But,' said General Itschner, 'the Soviets have shown marked ingenuity in dealing with this handicap.' A proposed 6,000,000 kilowatt dam will be across the Yenisei, in icy Siberia. Furthermore, General Itschner has estimated that at least 25,000 trained Soviet engineers are concentrating on the Russian water-development program. This compares with some 8,000 in General Itschner's own agency, and another 4,000 in the employ of the U.S. Bureau of Reclamation.

The Krasnoyarsk Dam on the Yenisei River will hoist ships 370 vertical feet, as compared with the 100 feet of the great McNary Dam lock on the Columbia River. Each of the generators at Krasnoyarsk will product 286,000 kilowatts; this compares with 108,000 kilowatts for the biggest American generators, presently in operation at Grand Coulee. Today, the total known capacity of Soviet hydro-electric plants is 25,883,188 kilowatts, although this does not include 44 plants for which output has not been disclosed. In comparison, total American hydro-electric capacity at the end of 1957 was 27,676,000 kilowatts, with about 10,000,000 more kilowatts under construction.

'Thus,' continued General Itschner, 'right now Soviet hydro-electric development appears to be roughly equal to ours in amount. However, their rate of increase is greater than ours . . . The United States has no plants completed which will reach the 2,000,000-kilowatt mark, although John Day Dam on the Columbia River, on which construction will start this year, will ultimately have 2,000,000 kilowatts if sufficient upstream storage is devel-

oped to make this amount of capacity economically justified.'

Being a soldier subject to superior orders, General Itschner did not add that the Republican Administration—plus its allies in Congress — had fought for four years to block construction of John Day by the federal governmen. Finally, the first John Day Dam appropriations were put through by Senator Carl Hayden, Democratic chairman of the Senate Appropriations Committee, over the antagonism of President Eisenhower's Bureau of the Budget. Nor did the General reveal that nearly 3,000,000 acre-feet of water had been eliminated from 'the sufficient upstream storage' which he mentioned by the decision of President Eisenhower's Administration to substitute three small private-utility dams for the great federal high dam at Hells Canyon.

Many Americans have a conception of Russia as a nation without technical skills. General Itschner does not share this notion. He told our Committee: 'A major feature of Soviet power development is the construction of a national transmission grid which will bring electricity, generated sometimes at remote hydro stations, to industrial centers of the U.S.S.R. The beginnings of this plan already have been accomplished . . .' General Itschner, under questioning, emphasized that 'building this equipment required Soviet engineers to solve unprecedented electro-mechanical problems.' The discussion then continued:

Senator O'Mahoney: 'If that is the case, General, I assume it is your opinion that the technical knowledge and efficiency of Soviet engineers should not be underestimated.'

General Itschner: 'Yes, Mr. Chairman. They have shown a very great ability in designing lines of this type. You see, the alternating current type of transmission line is the only type that has been used in the United States for any distances. Now, we see here a direct-current type of transmission that reaches up to 800 kilovolts. A great deal more electricity can go over an 800-kilovolt direct-current line than would go over an 800-kilovolt alternating-current line.'

Senator Kerr: 'Do you think we would know how to do the same thing in this country?'

General Itschner: 'I am sure we can do it, sir, but we have not yet accomplished it.'

It was a sombre group of Senators who listened to this testimony. Had we voted on Hells Canyon, or TVA self-financing, or a similar program for the Columbia River in that sobering moment, I doubt that there would have been many dissenters.

I sat at the long green-felt conference table in the same solemn mood, as General Itschner and Senator Ellender continued their startling disclosures. First, the General told us how Soviet use of inland waterways was beginning to challenge the superiority of the United States. As commerce multiplied through the locks on the Volga and other great rivers, American dominance in this realm was narrowing. American ton-mileage on its waterways in 1956 amounted to 130 per cent of 1950 and over 200 per cent of 1928. But Russian ton-mileage on its river systems was 175 per cent of 1950 and an unbelievable 820 per cent of 1928. 'Obviously,' said General Itschner, 'the Soviets are only beginning to learn to use their waterways in the modern sense with which we Americans are familiar.' While the Chief of our Corps of Army Engineers was speaking, I wondered if any twinges of conscience pricked those political spokesmen for the private-power companies who had tried so hard to discourage the construction of dams, which have increased by many-fold the barge commerce on the Columbia River where it cuts through the Cascade Mountain Range.

Through the long afternoon the comparisons continued—of 2,200-horsepower tugboats on Russian rivers, rivaling any such craft in the United States; of 6,000,000 Russian agricultural acres brought under irrigation between 1951 and 1956, as compared with 5,500,000 acres in the United States; of a Soviet reclamation project in the South Ukraine which will pump water to 8,500,000 acres, as contrasted with the 1,200,000 acres of the Columbia Basin project, biggest in the United States; of even 300,000-kilowatt turbines planned in Russia for the future, thus eclipsing by nearly three times those spinning below the penstocks at Grand Coulee Dam.

Senator Arthur V. Watkins of

Utah, for many years a prominent advocate of reclamation projects, was especially interested when Senator Ellender described the model city being constructed for the workers who will erect the immense Stalingrad Dam on the Volga River.

'That is the way we do it in the West—build our cities first,' said Senator Watkins.

'We do not do it that thoroughly, though,' replied Senator Ellender. 'This is a permanent city. I saw huge apartment houses built along wide avenues, lined with trees; in connection with this city they have hospitals, schools of all kinds, kindergarten and secondary schools, even technical schools, wherein the workers who work on the dam and who will probably be workers later when electricity is used to produce manufactured goods, can go to school in order to prepare themselves for the coming event when Stalingrad Dam is completed . . . They also have a large cultural center where children of the workers, as well as the workers themselves, who play music or who desire to take up drama in connection with their work, can come in and exhibit their talents.'

In one shattering burst, the Soviet Union has moved from peasantry to the industrial age. It exceeds us in area, in population, and in discipline. Does it exceed us in the capacity to sacrifice, so that a way of life—either by tyranny or freedom—may continue and endure? This may be the dominant question of our time.

The Theodore Roosevelt - TVA idea of unified and full river development has been an influence in Russian technological gains—in transportation as well as in industrial production. It is ironic that the Soviet Union has turned to its great rivers for strength just at a time when the American government is in the hands of the first administration in over two decades which has been fundamentally inhospitable to the whole idea of federal multi-purpose river projects.

If this policy persists, we shall have only ourselves to blame for wasting much of the sustenance and sinews of America. Rivers rushing downhill may be the muscles of a continent. Shall they be dissipated and made the object of waste? When I stand on the bank of a stream in my own home

region, I think of the incredible folly of those who would abandon such a resource. If Russia taps the Yenisei while we fritter away the Snake, who is at fault except ourselves?

Our destiny in power energy lies in waterfalls and that is why the warnings of such pilgrims as Senator Ellender and General Itschner must be heeded. The TVA idea of unified stream development, from Teddy Roosevelt's 'headwaters in the forest to its mouth on the coast,' was never more urgently needed in America than today.

And so the Selway flows to the Lochsa, the Lochsa to the Middle Fork, the Middle Fork to the Clearwater, the Clearwater to Snake River, the Snake at last to the Columbia, and the Columbia on to the sea.

A river flows on forever.

—Richard L. Neuberger

EDITOR'S COMMENTS: While this article by Senator Neuberger represents a position and point of view far in advance of most political thinking today (particularly that of the Eisenhower Administration), it still falls short of Technocracy's Hydrology Program for North America. For one thing, the 'Teddy' Roosevelt pronouncement on unit development of rivers is insufficient and obsolescent. The TVA was developed on that concept and, while it is an engineering triumph, it is a political bungle. A much better job could have been done if the 'unit river' concept had been abandoned and the TVA program had been made a part of a larger, multi-river project. The other river developments which the author envisions and, to a certain extent, eulogizes are too limited and too autonomous for Technocracy to endorse. The article also contains some political propaganda, particularly pro-Democratic propaganda. But, for the information it presents and the fighting spirit it exhibits, we are glad to reprint it in Technocracy Digest.

★ A COMMERCIAL CIVILIZATION throws on the scrap heap the most constructive element in human nature: the instinct to cooperate with one's fellows in building up the community.

The biological fact that man is a social animal is neglected, and a great storehouse of energy and enthusiasm wasted. —*Stuart Chase in The Progressive*

Do It Yourself

Are you a 'Do It Yourself' enthusiast? If so, read about the greatest opportunity you ever had to really do something for yourself. If you apply yourself along with other North Americans, you can help install the greatest civilization ever known.

SINCE WORLD WAR II many North Americans, caught in a squeeze between a shortage of skilled labor to perform many types of work about the home and the excessive cost of such labor when it did become available, have been learning how to do those jobs themselves. Including home carpentry, plumbing, electrical wiring, gardening, painting and decorating, and numerous other activities, the trend has become important enough to have had a whole new industry grow around it.

This industry which, practically speaking, did not exist at the end of the war, has in the few years since developed into a cross-Continent giant with more than a four - billion - dollar market. This business supplies the materials for the 'Do It Yourself' enthusiasts, whether they be amateur homebuilders or any of a wide selection of hobbyists with creative urges. One book, published for the express purpose of furnishing these people with further information on their pet projects, lists 2350 text books under 346 different headings covering about every subject imaginable. Undoubtedly, many of the big 'Do It Yourself' stores which cater exclusively to this trade could furnish the raw materials for the projects covered by these text books.

Has the unavailability and cost of skilled labor been the sole contributing factor to the growth of this trend? Apparently not, according to Business Service Bulletin No. 84, an official publication of the U.S. Department of Commerce, which comments:

'Increased earnings and more leisure hours have provided millions of Americans with both the income and the time for many new interests and activities. One of the most important of these new interests is the 'Do It Yourself' trend which includes home

carpentry, painting and decorating, gardening, and other activities in and around the home . . . During the war years, millions of men in the Armed Forces and women in war plants became familiar with the use of tools. The younger generation has learned much about woodworking and metal working in school.'

It is evident from the foregoing that 'Do It Yourself' could grow to such immense proportions in so short time only out of an environmental condition which was ripe for such growth. True, the industry growing along with it has been most successful in its promotional and advertising campaigns, but this could not have occurred if circumstances had not been favorable. The Price System, as usual, has merely taken lucrative advantage of a situation that had already developed. What were these ingredients which induced so many people suddenly to learn hitherto completely unfamiliar types of work? Why had they not done so earlier?

The answer to the latter question lies in a recapitulation of four major factors already mentioned, namely: (1) a shortage of skilled labor; (2) high cost of said labor when available; (3) the creation of new interests and activities brought about by increased earnings and leisure hours of numerous North Americans; and (4) the wartime training of many people in the use of a wide variety of tools. While any or all of these factors might have pertained in isolated individual cases previously, only a broad application of all of them could produce the great 'Do It Yourself' trend now in existence. During the Depression '30's, for instance, an uncomfortable proportion of the population had ample time at their disposal, but lacked the funds to buy more than the bare necessities of life. True, they had to do most of their own work around home, but much of it was pitifully makeshift because of lack of training and inability to buy necessary materials to make a proper job. Later, during the war, while overall incomes had taken a sharp rise, home construction and maintenance were at a low ebb because materials were unavailable. It is only since the war that the proper combination of circumstances has developed to bring about the great interest in 'Do It Yourself.'

Technocracy recognizes in the

rapid growth of this trend a characteristic response of people to a given set of environmental conditions. Irrespective of the commercial overtones, Technocracy Inc. applauds this response as a healthy indication of what might be expected when all North Americans are confronted with a much more vital change in their social environment—the necessity of discarding their obsolete Price System controls and replacing them with a functional governance designed to the specific requirements of abundance. Their demonstrated reaction to the 'Do It Yourself' campaign will be valuable basic training in meeting the exigencies of the forthcoming emergency. They will have the finest opportunity in history to prove how well they can do things for themselves when necessity demands.

This brings up a question that seems to bother many people who are otherwise attracted to Technocracy. 'How are you going to put that program into effect?'

The question indicates a mistaken notion of the reasons for existence of Technocracy Inc. Unlike the various political parties which are continually campaigning to get into or keep in office for reasons of preferential advantage, the sole purpose of the organization Technocracy Inc. is to point out the fallacies of Price System operation in an environment of abundance, and to promote the social program of Technocracy as the next most probable state of society in North America. There is abundant literature available to explain the numerous ramifications of that purpose. We will assume that the reader is sufficiently familiar with it to have at least mentally asked the above question.

Its answer does not lie merely with the enrolled membership of Technocracy Inc. Every North American by virtue of citizenship is responsible for implementing the only social program which was designed specifically for the particular circumstances brought about on this Continent by high-energy conversion in a generously endowed land area. Many will not fully recognize that responsibility until economic pressures have borne so severely upon their personal lives that their numerous escapisms cease to be effective. Meanwhile, those other citi-

zens who need not be victimized by personal catastrophe before recognizing their responsibility to society must be acquainted, if they have not already been, with the need for science in the social field. This has been and continues to be the self-imposed task of all Technocrats.

Here is where you come in. Your immediate assistance is needed in informing as many North Americans as possible of the social program of Technocracy and why it must be implemented as a measure of survival in the near future. You have already demonstrated, through the 'Do It Yourself' campaign, your ability to rise to an occasion which benefitted you financially. Much of the training thus gained could be put to excellent use in presenting Technocracy to ever-increasing numbers of your fellow citizens in a manner which will impress them with the vital importance of introducing scientific methods into social operations.

Visual aids have long been recognized as amongst the most effective methods of education, and of identifying designs of established patterns or objects of certain shapes with ideas of material goods. Thus, flags have become the recognized symbols of their respective nations. A certain curvaceously-shaped bottle immediately conjures in the minds of most people a familiar carbonated beverage.

Technocracy has used symbolization since its incorporation to keep North Americans aware of the organization even though they may not yet be ready to make personal investigations. This accounts for the round chrome and vermilion Monad markers (similar to the insignia worn by members) which motorists see and wonder about as they travel the Continent's highways. Very often they have been directly responsible for said motorists contacting the organization to learn what is behind the symbol. The markers were, of course, all made and erected by Technocrats. They have been people with some aptitude for drawing, painting, carpentry, and metal work who have done the work. Others have designed and printed the less frequent billboards with short, pithy messages of social significance to flash to passing motorists. More such personnel are required to produce more markers and bill-

boards for greater coverage than is now possible. If you have the training or inclination for such work you will be doing yourself and all North Americans a great service by volunteering that know-how to Technocracy Inc. where it can be put to the most advantageous use.

It is difficult to imagine any functional training which could not be effectively employed in some facet of Technocracy's educational program. Further to the matter of symbolization, it would be of invaluable assistance to have more members acquainted with sanding and painting of automobiles so that more Official Gray vehicles might be put on the road to create greater awareness of Technocracy. These cars, travelling singly or in fleets, have even in their present numbers presented a greater single visual impact than any other medium. Many more are needed.

Are you a plumber, carpenter or electrician? The organization operates headquarters throughout the Continent that need maintenance, and contemplates expansion in other centers as rapidly as warranted. Some premises may be in buildings previously used for other purposes, in which case it is almost a certainty that various alterations would be required to meeet the specific requirements of Technocracy operations in the area concerned. Very likely all three of the above types of service plus a few more would be required to effect the necessary changes.

Have you had writing, speaking or teaching experience?

Technocracy Inc. publishes three field magazines (including the one you are now reading) at quarterly intervals. Most of the material is written by members and all of it is so edited. The Organization also has its own printing presses in some centres and needs personnel who can operate them.

Whenever necessary Technocracy trains its own speakers from the ground up on the fundamentals of public speaking, employing a technique which has developed a particularly high calibre of speakers. However, it would be a distinct advantage from the standpoint of time saved to have on the roster persons who have had speaking experience and who, once they have become sufficiently familiar with Techno-

cracy, could present it effectively and objectively without the need for intensive prior training.

Monad markers, billboards, literature and lectures are the principal methods of arousing primary interest amongst non-members in the body of thought of Technocracy. Presuming these techniques have been sufficiently successful in certain cases to induce non-members to become members, the next obvious step is to let them know what it is all about. This is the job of the Education Committee which conducts regular study classes through the 22-lesson **Technocracy Study Course.** Certainly, no person could adequately conduct such classes without having first became familiar with the Course; but once again, after this has been accomplished, a person with teaching experience should be a more effective class leader than one who has not had such training.

Only a fraction of the regular activities carried on within any local Section of Technocracy Inc. has been mentioned. In addition there are numerous others requiring the services of persons with clerical, accounting and various other forms of experience. If there is a full-time staff, there should be a cook available to prepare meals. Not by any means have all members had formal training in the various functions, nor is it always necessary, for it is often possible and frequently preferable to give them the required instruction within the Organization. Accordingly, no one should feel that there is no place for him or her within Technocracy Inc. because of a lack of formal education or training. It is the aggregate of numerous small parts that has the overall impact.

Those who have been Technocrats for any appreciable length of time have often found themselves much benefitted by the experience gained in carrying on the regular functions of their respective Sections. They have been doing many things of a technical nature which they would otherwise never have thought of doing, and as a consequence have in some cases been able to perform a more responsible, lucrative Price System job than before. But this has been only a subsidiary result. In exerting their utmost for Technocracy, they have been answering the question of

how the social program will be put into effect. It will be accomplished by them and those other North Americans who are aware enough of their social responsibility to realize they can no longer 'leave it to the Technocrats' to finish the job started by the Technical Alliance 40 years ago.

Technocracy Inc. has the social program—the only one adequate to meet the requirements of an economy of abundance. This organization long ago projected an analysis of the scarcity-conceived Price System, pointing out that the increased employment of kilowatt hours for the production of physical goods would eventually result in an irreconcilable conflict with the monetary structure. The analysis was long ridiculed but never refuted, for its conclusions and predictions were unassailable on a long term basis — to the present discomfort of politicians and industrialists. Once again, after a long war and post-war induced prosperity, the citizenry of North America are arousing from their social dormancy and are 'finding' Technocracy which has been in their midst all along. They are beginning to give new thought to the social blueprint which has never been compromised for temporary expediency and stands more applicable today than when it was first presented to depression-weary North Americans a quarter century ago.

Technocracy Inc. has the program which it has been presenting and will continue to present. Its purpose does not go beyond that, for the Organization is purely of an educational and research nature with no assumption of power theory. This being the case, it is the job of **all** North Americans— including the relatively few Technocrats who have already done a colossal job of preparation — to demand of their elected political governments that the failing Price System be replaced by a design of operation that is in accord with the physical environment. When the pressure of events weighs heavily enough to necessitate social change, no government could deny a two-thirds majority vote of the citizenry to implement that change.

Preparing North Americans for vital social change is the biggest 'Do It Yourself' job ever undertaken by any people.

—Rupert N. Urquhart

Our Propaganda Dilemma

It's an unpleasant view from here, but we may as well face it. America is losing the propaganda war with Russia. Why the U.S. is losing is explained by John G. Schneider, author of a novel on the making of a President by the miracle men of Madison Avenue.

THE guy says to me, 'If you had the job of directing American propaganda—'

'No, thanks,' I interrupted hastily. 'I'm not **that** hungry.'

I was thinking that as propaganda boss a fellow would have to send out to the rest of the world carloads of dreary 'truth'; he'd have to paint pretty pictures of the works and ways of old Diehard Dulles; he'd have to do the impossible. And may God have mercy on his tormented soul.

'Look,' the guy says, 'I'm not asking you to believe that all's for the best in this best of all possible nations — although we agree that on balance it probably is the best of existing national societies. Certainly the United States at its worst is preferable to the Welfare State as typified by England, the Chaos State of France, the old Corporate State of Mussolini, the Great Beast State of Hitler or the Unspeakable State of the Communists. Agreed? Good. So we admit that our product isn't very good, even though it's the best available. We're just assuming that you have this job to do. Your client is not only the government, it's also the people, culture, economy of the United States—the works. Your immediate assignment is to turn the tide in the propaganda war. We've been losing: you tell us how we start winning.'

'But I've got no "expertise" on the subject.'

'Who has?'

The guy had me there. Who has? 'I'll give it some thought,' I said lamely. And I did. A lot of thought. Conclusion: negative.

There simply is no solution to our propaganda dilemma, not unless (a) there should occur a sudden miraculous, impossible, across-the-board improvement in our government, economy, educa-

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tional system and cultural level, or (b) we should—unthinkably! — silence the press in order to make possible use of what the guy calls 'Madison Avenue techniques.' It's an unpleasant view from here, but we might as well face it. We can't win a propaganda war with the Soviets. However, we can do better than we've done — and hope the opposition will blunder itself over onto the losing side.

It might be helpful to consider why we're losing and they're winning, and what unattainable desiderata would give our propagandists a fighting chance. As a starting point, we might try to figure what it is that gives to Soviet propaganda its undeniable high potency.

Simple! Soviet propaganda has what public-relations men and ad-men call a 'pitch'—a direction. Everything that's poured into the propaganda funnel, everything from statistics to sputniks, comes out as part of the pitch. The Soviets have analyzed their market, and shrewdly. They found that the whole, big, neurotic world wants **peace.** So peace is the first part of the one-two propaganda pitch. But great areas of the world, notably in Asia and Africa, also desperately want **progress** — in technology, manufacturing, agriculture, power development, transportation. Moreover, they want this progress **communally,** not for the enrichment of capitalists.

So the Soviets plug peace for everybody, but especially for Europe, and full bellies and electric lights for Asia and Africa. It's a solid propaganda pitch, and it works.

We have no pitch and we need one. Not a slogan, mind you, not an endlessly repeated sales spiel. What we need is a propaganda policy which will enable us to use almost every conceivable kind of material to support and sustain the policy.

Demonstrably, we've been doing badly without such a pitch. We've operated, or so we've been told, from a pious premise which holds that the best propaganda is simply to 'tell the truth.' Which is naiveté carried to the point of absurdity. Telling the truth—to the extent that we have—has kept us on the defensive, busy replying to charges made against us, and it has so dispersed and diluted our propaganda words that they have

come to mean anything and nothing.

What should the American pitch be? At this point, let us turn to market analysis. The question is, what does the rest of the world want us to be? Peaceful, of course: which we are, though we seldom show it. We need not concern ourselves with the 'progress' which is an imperative for the Soviets; natives in the most remote Indian villages know that we're just awfully good at making automobiles and stuff; they know, too, that they were getting dams and power plants from us long before the Russians got into the act. I submit that what both our allies and the uncommitted nations want us to be, first of all, is a **mature,** hence a responsible, power. In all the long years of Britain's world leadership there never was any question about her maturity and responsibility. She was usually greedily exploitative, often aggressive, frequently dead wrong—but always she was respected as a proper leader of nations. We aren't.

So if I were bossing propaganda —and once again, heaven forbid! —I'd try to sell the United States as a peaceful and mature national society. **Peace** and **maturity,** then. A good, solid pitch but, as has been noted sadly, impossible. It would require first some impossibly heroic deeds to give this propaganda a fighting chance. Let's see. First speaking of **Peace:**

The Army, Navy and Air Force would have to cease operating as huge talent agencies vigorously promoting their top brass to any radio or television program which will have them. And damn near every program does have them, in droves. Daily, hourly, the generals and admirals are on the air bickering and bragging, bidding, doubling and redoubling. Inevitably, the most sensational and irresponsible of their comments get into the channels of international communications. This is the voice of a peace-loving nation? Hah! It would be a great day for American propaganda if someone would tell all those military-theatrical hams to shut up and go back to work.

And wouldn't it be wonderful if Mr. Dulles should manfully disengage himself from that attitude which had its origin in his political campaign speeches in 1952? Thence flowed such non-peaceful propaganda as 'massive retalia-

tion' and 'brink of war' and 'unleashing Chiang' and 'liberation.' Mr. Dulles alone makes it almost impossible for American propaganda to use a peace pitch.

But he is aided and abetted by the military and the press in the hysterical overemphasis on weapons development. To an observer overseas it must seem that skies over the United States are black with missiles and rockets, with ICBM's, IRBM's and presumably BMT's and IRT's. Scores and hundreds of unrestrained news items about launchings, delayed launchings, attempted launchings, projected launchings. Is it really front-page news when one or another of the warring services announces with appropriate fanfare that it has successfully launched the first rocket stage of an experimental three-stage missile? Small wonder if the observer overseas concludes that these Americans are missile-mad and rocket-rabid. (Note that the same observer gets no such impression of the Soviet Union, which frugally saves its news for an awe-inspiring speech by Khrushchev or an awesome fact such as sputnik.)

Finally — although it would be easy to go on and on — the American citizenry itself makes it rough for the propagandist who's trying to picture Uncle Sam as a peace-loving character. The citizenry, and its elected representatives, reacted semi-hysterically to the completely hysterical editorials which followed close on the flying heels of the sputniks. What the world heard was a cacophony of hypochondriac voices screaming: five billions... crash program! . . . ten billions ... control of space is control of the world! . . . thirty billions . . . fifty thousand engineers, right away! . . . fifty billions . . . a couple thousand submarines armed with nuclear rockets! . . . eighty billions . . . we gotta get to the moon ahead of the Russians, we gotta! ... 100 billions ... billions, billions, billions.

I said to the guy, 'Look, do not even these few examples prove that it's impossible for American propaganda to convince the rest of the world (always excluding the USSR and satellites) that America is in truth a peace-loving nation? Thank you. Knew you'd see it my way.'

Now let's consider what we're up against when we try to propagandize America as a mature,

hence an emotionally stable, intellectually adequate and trustworthy **leader** of the free world.

And, oh, dear!—how can others see us as anything other than a childish, rich, uneducated, excitable, headstrong, quarrelsome, spoiled brat of a nation?

Are America's ugly and discriminatory immigration policies those of a mature and enlightened society? No.

Is it a mark of maturity to have Radio Free Europe constantly needling the satellite peoples — as the Hungarians bitterly alleged—when there is absolutely no chance of 'liberation' in the foreseeable future, and when existence itself may depend on reducing frictions and irritations between the two colossi, Russia and America? No.

Is it the wisdom of maturity which insists that old islander Chiang Kai-shek is the logical and only representative of the Chinese people? No.

These are the things which make a propagandist wish he'd stuck to popularizing soap or plugging Broadway shows. But there are even bigger obstacles. For example, I'm informed in reply to an inquiry that yes. our propagandists do still promote the concept of 'free competitive enterprise' as basic in the American economy. Now this is ridiculous. In the first place, it isn't true, and in the second, even if it were it would be thoroughly bad propaganda.

Consider. Almost all of the world, including the United States, simply does not want a competitive, 'free enterprise,' capitalist economy. Smacks too much of the bad old days of exploitation, colonialism, want and fear. Therefore our propaganda would be much more palatable if it told the truth. So long as there is no competition in either prices or wages, ours is **not** a competitive economy. In all basic industries we have the administered price — and we're **almost** given over to what might well be called the administered wage. We're not 'competitive,' nor are we 'free enterprise,' or capitalist. What we have is a union-management corporative economy, and we should come right out and say so. It might be good news to those nations which are shopping the non-capitalist markets, looking at communism, socialism, welfare state-ism and other forms of eco-

nomic organization. The United States appears rather childish to be still g o i n g for the old, discredited capitalism stuff — it's as if a great, h u l k i n g man went about prating that he still believes in Santa Claus.

Then there is the stubbornly held, and far too often voiced, conviction that the United States is a 'Christian nation.' This Big Lie thunders from political platforms, from the floors of House and Senate, from all manner of sources whence it is sure to get into world-wide c i r c u l a t i o n. Which is too bad. After all, Christians make up a tiny minority among the peoples of the earth. And it would be very good propaganda if we should explain to Moslems, Jews, B u d d i s t s and atheists that the United States is **not** Christian. Specifically and categorically. T h e constitution says so. And never has this nation seemed so mature, so wise, as when the framers of the Constitution put religion in its place.

Well, occasionally t h e p o o r propagandist gets a break. We've shown some remarkable maturity in sending abroad as representatives of American culture such admirable artists as Marian Anderson and the **Porgy and Bess** company. At the same time the propagandist w o u l d wish, but wistfully and knowing the futility of it all, that somehow America could reduce its booming export of rock 'n roll, ambulatory supermarkets, bodies beautiful, Cohn & Schine, l u s h - living military officers, prize-fighters, semi-literate and bad - mannered tourists, v a c u o u s TV shows and Billy Graham.

See? I told the guy there just wasn't any solution to our propaganda problem. Any fool could tell him why we're losing: there's nobody, nobody, to tell him how to win. **—John G. Schneider**

★ PULLMAN, Wash.—A new product that looks like brown marble, shines like glass and wears like iron has been produced by scientists of Washington State College.

It's a new board called 'flapreg,' heavier than wood but only half as heavy as aluminum. It can be used to build everything from golf club heads to counter tops, the school said.

Dr. George Merra, head of the college's wood technology section, said he views flapreg as one of the section's most significant developments in several years.

—Associated Press

Automation Is for Everyone

INDUSTRY'S electronic 'brain' — the computor — will give labor a four-hour work day, say two American experts visiting Vancouver.

Technicalities aside, the question that will arise at once in many minds is: 'But, will this mean only four hours' pay at old rates?' This presupposes that all the benefits of automation would be retained by investors and managers.

Fortunately this is impossible. What is overlooked by those who express this fear is the real base of the North American economy. This is the mass production system. Automation would be useless unless it extended the benefits of mass production.

It cannot extend these benefits — and here is the inescapable point — unless there is a mass market to absorb the goods. Existence of an effective mass market depends on widely distributed purchasing power. This needs to be qualified further with the word 'ample' purchasing power.

If purchasing power for individuals and families were limited, the applications of automation would be correspondingly limited. People satisfy their primary wants first. If their wage packets permit not much more than this then there is no market for the hundreds of appliances, gadgets, services, that added to primary satisfactions make up a high living standard.

Industry is learning now — in some cases the hard way — how absolutely dependent it is on the average man's prosperity. It is not the rich who buy the great bulk of standard commodities, but average people.

The logic of this will enforce wide distribution of purchasing power. Otherwise the improvements of automation would defeat themselves—which is what would happen if automation merely displaced worker-consumers. **—Vancouver Province**

★ GENEVA—Unemployment is increasing almost everywhere, including the Communist countries of Eastern Europe, the International Labor Organization reports. *—Reuters*

Face Facts on Jobless

PROVINCIAL Labor Minister Lyle Wicks' diagnosis of Ottawa's attitude to unemployment confirms what The Sun has several times suggested.

The Diefenbaker government is determined to ignore what properly ought to be called 'recessional unemployment.'

At the recent municipal-provincial-federal conference on the jobless problem, Mr. Wicks complains, Ottawa tried to restrict discussion to seasonal unemployment. It would limit discussion to what may be expected this winter.

At that, Ottawa has a right to be concerned about the coming winter. As Ald. Halford Wilson said, unemployment is bad enough now and likely to be worse in the winter if preventive steps aren't taken. The same day he said it, the local unemployment insurance office warned that 'no significant improvement can be expected in the near future.'

How true this could be is shown in official figures this week disclosing 320,000 Canadian out of work in mid-June. This is a decline of 46,000 from May but double the figure of a year previous.

It was a post-war record for mid-June. The previous high was 186,000 in June, 1954.

As for Vancouver, 31,667 were registered for work, 10 per cent fewer than in May, but also double the number a year before.

The figures speak for themselves. It may comfort some, including the government, that 320,000 is 270,000 fewer than in mid-March. But if the idea is reversed it leads to fears that the figures might easily be doubled by winter.

There's a seeming paradox in the fact that though unemployment is high, total employment still hangs high also. This total increased to nearly 5,800,000 in mid-June, up 129,000 from the month previous.

Yet it remains a fact that the total is 40,000 below the 1957 June level. The situation becomes difficult for those still out of work when prices remain generally high. They suffer the more.

—Vancouver Sun

TECHNOCRACY

NORTH AMERICA'S ONLY SOCIAL DYNAMIC

WHAT ?

★ Technocracy is the only North American social movement with a North American program which has become widespread on this Continent. It has no affiliation with any other organization, group or association either in North America or elsewhere.

★ The basic unit of Technocracy is the chartered Section consisting of a minimum of 50 members and running up to several hundred.

★ It is not a commercial organization or a political party; it has no financial subsidy or endowment and has no debts. Technocracy is supported entirely by the dues and donations of its own members. The widespread membership activities of Technocracy are performed voluntarily; no royalties, commissions or bonuses are paid, and only a small full-time staff receives subsistence allowances. The annual dues are $9.00 which are paid by the member to his local Section.

★ Members wear the chromium and vermilion insignia of Technocracy — the Monad, an ancient generic symbol signifying balance.

WHERE ?

★ There are units and members of Technocracy in almost every State in the U.S. and in all Provinces in Canada, and in addition there are members in Alaska, Hawaii, Panama, Puerto Rico and in numerous other places with the Armed Forces.

★ Members of Technocracy are glad to travel many miles to discuss Technocracy's Program with any interested people and Continental Headquarters will be pleased to inform any one of the location of the nearest Technocracy unit.

WHEN ?

★ Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers and economists that become known in 1920 as The Technical Alliance — a research organization. In 1933 it was incorporated under the laws of the State of New York as a non-profit, non-political, non-sectarian membership organization. In 1934, Howard Scott, Director - in - Chief, made his first Continental lecture tour which laid the foundations of the present nation - wide membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing.

WHO ?

★ Technocracy was built in North America by North Americans. It is composed of North American citizens of all walks of life. Technocracy's membership is a composite of all the occupations, economic levels, races and religions which make up this Continent. Membership is open only to North American citizens. Aliens and politicians are not eligible. (By politicians is meant those holding elective political office or active office in any political party.)

★ Doctor, lawyer, storekeeper, farmer, mechanic, teacher, preacher or housewife — as long as you are a patriotic North American — you are welcome in Technocracy.

TECHNOCRACY

Whatever the future of Technocracy, one must fairly say that it is the only program of social and economic reconstruction which is in complete intellectual and technical accord with the age in which we live.

—Encyclopedia Americana

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TECHNOCRACY DIGEST

NOV. 5-8

Living Without Working

Assignment of Responsibility

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A Million Jobs Have Gone

Distribution Puzzle

Consumers Become Important

Automation Invades Bank

No. 170

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TECHNOCRACY DIGEST

THE ONLY MAGAZINE IN CANADA THAT IS PREPARING THE PEOPLE OF THIS COUNTRY FOR SOCIAL CHANGE.

NOVEMBER, 1958 **No. 170**

STAFF

DONALD BRUCE.....*Editor*
MILTON WILDFONG.....*Assistant Editor*
RUPERT N. URQUHART, *Assistant Editor*
ED BRODERICK.....*Assistant Editor*
JANE URQUHART....*Circulation Manager*
HELEN SLATER.....*Business Manager*

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The Quarterly Survey

Unions and Automation

Canada's largest national labor union, the Canadian Brotherhood of Railway Employees, has asked the federal government to set up a permanent advisory committee on automation.

The union has recommended that the committee should be set up to guide the government so that automation will 'contribute to the social and economic betterment of all Canadian people.'

Specifically suggested for consideration by the committee were shortening of hours of work to relieve unemployment, increasing wages commensurate to the country's ability to produce and ensuring by legislation the retraining of workers 'adversely affected by technological advances.'

Unemployment Up

A jump in Canadian unemployment is indicated in a survey made to September 20 jointly by the federal department of labor and the Dominion bureau of statistics.

The 271,000 persons out of work and seeking jobs compared with 197,000 a year ago. In addition, another 14,000 Canadians were listed as on temporary layoff.

The survey broke down the total labor force as follows: 5,560,000 or 90.3% working 35 hours or more in the survey week; 328,000 or 5.3% working less than 35 hours; 271,000 or 4.4% out of work and seeking jobs.

Fitzpatrick in The St. Louis Post-Dispatch

While the Bear Roams All Around

Letter to Editor

'We Technocrats were very interested in Gordon McCallum's story on the Hudson Hope Dam proposed to be built on the Peace River by the Wenner-Gren interests. However, we would like to set the record straight on Mr. McCallum's statement that "A way of using direct current discovered by the Swedes . . . is said to be the key of transmitting power over long distances without appreciable loss."

'In the spring of 1924, Howard Scott, then consulting engineer for the State of New York and now director-in-chief of Technocracy Inc., drew up a power transmission report for the state which presented a method of overcoming the limitations of electrical transmission for long distances through the use of direct current.

'As another sidelight on the big B.C. project now so much in the news, we quote from the article "Power for a Continent" which appeared in Technocracy Magazine in 1939: "Hudson Hope on the Peace River will develop more power than Boulder Dam."

DONALD BRUCE

Editor, Technocracy Digest.'

(Reprinted from the letters-to-the-editor column in the October 28 issue of the Vancouver Province.)

Herblock in The Washington Post

"Your Office Seems To Be On Fire"

★ LONDON, Ont.—Scientists should get out of the ivory tower and enter into community life, Dr. Louis N. Katz, past president of the American Physiological Society, told more than 400 delegates to the 10th annual convention of the society here.

'We must explain our role as scientists to our community . . . and help to establish the environmental climate by which scientific discoveries will be used for good and not for evil,' he said. —*Canadian Press*

Living Without Working

Technocracy has always predicted a decline in the human labor on this Continent and has foreseen the day when human beings would be freed from work for the greater part of their lifetime. In this vision of the future, Technocracy has been alone.

WORK (as such) is not necessary to the health, welfare, and happiness of human beings. For most people of the past and present, however, work has been advisable as an unavoidable means of acquiring the necessities of life. Work has been an unpleasantness associated with living. But that situation is now changing and work is passing out of men's lives; for mankind has devised ways and means of getting the required work done without human toil. More, and more ingenious, machines are being set up to do the work formerly done by human muscles, as well as the work (vigilance) required of man's senses, and also much of the lower orders of 'brain work.' The day is near at hand when mankind must think seriously of living without working.

Technocracy has never subscribed to any 'right to work' or 'full employment' philosophy; it has always deplored human toil. When certain liberal politicians were preaching of sixty million jobs as a social ideal for the United States, and later when conservative politicians heralded the advent of sixty-five million jobs as a great political achievement, Technocracy continued to hold the position that any nation which requires that many jobs in its operation is in serious need of overhauling and streamlining. Sixty million jobs is a symptom of inefficiency and waste. That many jobs are to be regretted rather than applauded.

Technocracy has always predicted a decline in the human labor in this Continent and has foreseen the day when human beings would be freed from work for the greater part of their lifetime. In this vision of the future, Technocracy has been alone. All Price System groups have looked upon jobs of work as a social necessity and a blessing. At most, they have merely advocated that

the worst features of toil be mitigated through the use of machines and extraneous energy. But it so happens that this point of view came about only after technological progress made it possible to achieve greater productivity with less muscle-power; even so, this view is more popular among employers than among the workers.

Recently, some thought has been given to the advisability of reducing the hours of employment for the jobholders; but this thinking has not dealt so much with freeing the human being from toil as with spreading the work over more jobs. It is already too late for this type of thinking to have practical application. Rather, the time is at hand when men should be thinking about the elimination of work altogether and of the probable social consequences deriving from people living without work.

The forthcoming new freedom from work will require major adjustments in the individual patterns and concepts long associated with working for a living. We must quickly overcome centuries of conditioning regarding the morality of toil. This latter is no small consideration in view of the fact that people have never been 'disciplined' for freedom; rather, they have been innoculated with philosophical 'wisdom' pertaining to toil and leisure, both of which are virulent social diseases in this modern age.

What will be the behavior of a population freed from the rigors and discipline of steady work? That is a question that cannot go unanswered for long. It is a question which never arose in the past, for it had no possible application. The problem of the past was just the opposite, how to keep people working.

Idleness was always treated as somehow immoral, if not criminal, by all past societies. On the other hand, work was treated as a virtue. Both of these treatments were in the nature of philosophical persuasion; and both implied that work was contrary to human inclinations while idleness was hedonistically attractive — else why the need for persuasion? But the concepts of idleness as being sinful and work as being virtuous were also matters of practical necessity. Humans had to work in order to provide the necessities and comforts of life, for all past societies were based on human

toil as the chief form of energy conversion. Work was not only socially useful, it was socially necessary; hence, it was a social 'good.'

Society, in developing its philosophical persuasions, tends to place the social values on the means rather than the objective—the ritual rather than the substance. Work was the means of providing the goods consumed in living; but the emphasis was placed on the virtue of work rather than on the virtue of producing goods. Philosophically, goods were some sort of reward or blessing conferred upon one for being virtuous with respect to work. Hence, work was the important thing; production, though desirable, was incidental.

This philosophy regarding work and idleness applied only to the 'common people.' The aristocracy, a distinct and separate class of beings, was not subject to the morality of the vulgate. To this class work was to be shunned as a social disgrace; but, on the other hand, pure idleness was also disdainful. So a compromise pattern was developed to avoid both work and idleness. This pattern was known as leisure. Under leisure, one was expected to keep busy after a fashion, but not busy at anything useful. One could engage in certain stereotyped sports, or 'serve' as an officer in the military, or become an official in charge of regulating other human beings (that is, enter into government service), or one could join the upper echelons in the hierarchy of the priesthood. The honor of membership in the leisure class was usually hereditary, although there were a few exceptional means of worming one's way into it.

Aside from being entitled (and obligated) to leisure, the Upper Class was also privileged to consume far more than its pro rata share of the produce. Often this share was so great that ostentatious and profligate waste was resorted to in order to dispose of the take. Human cussedness being what it is, waste was often practised on a gigantic scale by the aristocracy even while large numbers of the common people and slaves were suffering extreme privation. When privilege, opportunity, and cussedness become combined in such egotistical personages as Cheops, Solomon, Louis XIV, Napoleon, or J. P.

Morgan (to mention only a few), the wealth of nations was squandered, human lives were expended lavishly, and poverty and toil prevailed on a grander scale than usual.

Leisure has been a very costly social disease throughout the ages of civilization. It has t a i n t e d everything that has become associated with it. Today, golf and art collecting, for instance, are so tainted, simply because they have become symbols of leisure, not because there is anything intrinsically 'bad' with golf as a game or as an exercise or with art collecting as a form of interior decoration or as a means of preserving the relics of the past. Various other sports and activities, which once were useful or at least enjoyed by the many, are now degenerating into leisure time luxuries; such as, for example, skiing, fishing, hunting, boating, horseriding, and photography. It is true that the 'common people' can play at all these things (as well as at golf, or at collecting replica art); but they are not 'true sportsmen' unless they can lay out fantastic sums of cash for paraphernalia, club memberships (which provide special privileges and exclusive rights), and corollary activities and accessories. There are also certain blue-book rules and formulae to be observed if you would conduct yourself as a 'gentleman' or 'lady.'

Other forms in which leisure may appear are those of patronage of the arts and frequenting swank night clubs. Both of these activities are very expensive and very snooty. If you participate in them, then, it is certain that you do not have to work for a living. You are properly one of the leisure class.

Thus, leisure is something different than freedom from work; it is the social antithesis of work. Leisure has social prestige, which work does not have. But, in order for the few to have leisure, the majority m u s t toil. The whole substance, facade, and pretense of leisure would disintegrate should it become available to all; it has meaning only in its contrast to toil. Work and leisure, being opposites, are like sin and virtue, one c a n n o t exist without the other. At the time that work is abolished, leisure must also be abolished.

Leisure is a social deficit; it produces nothing and it is ex-

tremely costly to the society. It can be supported only when it is restricted to a very few people. If attempted by the majority, leisure would bog down any economy. Even today, the American economy is bogging down from the majority of the people's aspiring to leisure class status. The American people want leisure class types of dwellings, vehicles, clothes, household bric-a-brac, club memberships, and sports paraphernalia. The economy cannot support so much pretense, for the pretensions of leisure are so wasteful of resources and energy, of time and effort. Besides, there is no end of aspirations to ostentation once they become rampant.

Freedom from toil is as different from leisure as it is from work, both in its concepts and its social consequences. When freedom comes to all, without contrasts in the society, it does not take on the glamor and trappings that go with leisure; it becomes a matter-of-fact way of life. Freedom from toil carries with it no social distinction.

But freedom from toil for the populace does present certain social problems which call for consideration and study by those concerned with planning for the future. Most human beings are dynamic creatures. Only a few have the talent and inclination to become loafers. The great majority will want to 'do something' with their time — the eager beavers 'worst' of all.

Perhaps the primary problem with which society will be confronted in this respect — when all people have freedom from toil — will be that of holding down costs. So many people have learned to think in terms of destruction or ostentation when they think of being able to do whatever they want. It is a carry-over from past emulation of leisure, in part, and natural inclination or imitation of example, for the rest. Today, only lack of sufficient money and free time keeps many people from being as great social deficits as they would like to be. Merely a fraction of the present population would be inclined to be constructive with its time and effort if turned loose to follow free choice of activity. Destruction is so much more exciting. The social problem with respect to the majority of the population would be that of keeping

them entertained at minimal social cost.

It should be immediately obvious that some things that people like to do cannot be done by a majority in any well-settled area. Big game hunting would be **out** as a major popular activity. There just is not enough big game in the world to satisfy the yen of as much as ten per cent of the ordinary would-be nimrods. As for the Ernest Hemingways and Teddy Roosevelts, a few dozen of those in the world would be too many. A more appropriate and feasible pastime would be the 'hunting' of big game on well-protected preserves with cameras and field glasses.

Game fishing would not have to be restricted as much as big game hunting. When the fresh waters of the Continent are impounded and developed for (among other things) recreational purposes, fishing can be enjoyed by all who yearn for it. If the fresh-water spots become over-crowded, there are always the oceans. The principal concern of the society will be, what happens to the fish that are caught? As for the boat-fisherman, on the inland lakes at least, his major concern will be finding areas undisturbed by the water-skiing and speed-boating enthusiasts.

At present, a great deal of recreational interest centers on waterfront areas, particularly on the beaches of lakes and oceans. Once the development of water-front recreational areas is taken out of the hands of commercial enterprisers and their political stooges, the society can provide all the water-front facilities that the public requires and at relatively low cost. There are many thousands of miles of ocean, lake, and river frontage at present neglected; and much more can be added in connection with extensive hydrological developments.

For those who like gentle voyaging, large passenger boats can be provided in adequate numbers. For the most part, these would ply the inland waterways rather than the rougher oceans. Extensive water travel can be brought within the experience of all who enjoy it. As for luxurious yachting, it is not easy to see how that would fit into the social scene. For one thing, the cost is excessively high; and it would not be practicable for any large number of people. For another thing, it is

an appurtenance of leisure rather than of freedom.

For those who prefer the mountains and forests, at least on occasion, the Continent affords an abundance of suitable areas which can be developed and serviced at minimal cost to the society. Much of our present and potential woodland and mountain areas are places of wilderness or desolation, great areas of which have been despoiled and abandoned. Their maximal utilization, including that of recreation, would have to be part of a Continent-wide program of area development.

At this point, we might mention that the development of the Continent in the first instance and for a considerable time thereafter will employ a large mobile 'army' of construction personnel. It is conceivable that as many people may be employed for a while in reconstructing the Continent as were employed in World War II to wreak havoc around the world. However, the cost would be (in comparison) slight, the danger would be insignificant, and the objective would be positive and long-term. This program would be carried out as a transitional stage between the era of toil and the era of freedom. Furthermore, it would be socially useful as a means of re-orienting the population from destructive interests toward constructive achievements; and it would provide time for the residue of die-hard devotees of toil and leisure to outgrow the period of their greatest fervor.

When commercialism is taken out of sports, there probably will be a de-emphasis of mass spectator sports in favor of personal participation sports. We can also anticipate that performance in sports will be judged more on the basis of objective standards rather than on winning out against personal competitors. Anyway, numerous simple sporting events can be provided for the enjoyment of those whose interests are in that direction, either frequently or occasionally.

Of course, not all people are devoted to sports or to active play. Some will prefer intellectual interests, and these will cover as wide a range of subjects as there are fields of knowledge. Others will find their interests and pleasures centered in eating and socializing with other people —

as such, and not as adjuncts to leisure.

No doubt, even under the best of environments and conditioning, certain types of individuals would be delighted to engage in the kinds of activities which have become known as hooliganism, hell-raising, or brawling. Only slightly less obnoxious is the practical joker. No responsible society would tolerate such behavior. An effective control of liquor, dope, and other chemical stimulators and narcotics would go a long way toward eliminating hooliganism and irresponsible boisterousness. As for confirmed hooligans, no doubt the social control can devise means of cooling off their ardor for mischief against others. Let the practical joker get his amusement in Fun Houses, such as can be found at present on any Midway. And let the hearties blow off steam with others of their kind on excursions and parties which are insulated from the less boisterous folks in the society.

Art in its many forms would provide creative and enjoyable activity for large numbers of people. Much of this activity will be in the nature of a boondoggle —of interest only to the personal artist and, perhaps, his immediate associates. Some, possibly a large part of, art work can be directed along useful lines; such as, for example, photographic and pictorial illustration of natural history forms, of topographic features, and of man-made objects. This would serve as a guide in the study of man and his environment and as a documentary record of historical events. Other branches of art would be musical composition and rendition, dancing and posing, reciting and dramatics.

Most art creations will not be worth preserving for posterity, but they will provide interesting and enjoyable pastimes for their creators. It is when the artist's ego demands that his work be inflicted upon society, particularly when the works take gigantic form, that society will be forced to assume a regulatory role. Artists like Gutzon Borglum, Frank Lloyd Wright, Cecil B. DeMille, Florenz Ziegfield, or Salvador Dali (to mention only a few recent American examples) cannot be turned loose in the world without check-reins of some sort. A few of the best of such artists

may be sponsored by the society, but only a few. That sort of thing can get out of hand if not controlled, as illustrated by certain historical examples, for instance the Pyramids of Egypt and Mexico, the stone heads of Easter Island, the cathedrals and castles of Europe, the temples of Burma and Cambodia, the wood carvings of the northern Pacific coast Indians.

A more useful and, for some people, a more interesting activity would be that of technological design and invention. There are numerous problems and challenges in the technological field would provide stimulus and excitement for those with puzzle-solving and inventive talents. So, when people do not have to devote their lives to earning a living, these individuals can proceed to tackle some problem of interest to them. It may involve finding a fundamental answer to some 'mystery' in nature; or it may involve finding a simpler way of doing some little job. Out of problems come the motivations for invention; but important ingredients of invention are time and concentration of attention. People freed from daily labors would have the essential opportunity.

One criticism of material abundance and freedom from toil has been in the form of speculative argument that human beings would become lethargic and static; that is, become lazy in both the physical and intellectual sense. It is argued that they would lose interest in improving themselves and society. But this argument can be refuted by reference to many people who did not have to work for a living yet led very active lives. Considering the biological dynamism of human beings, particularly when they are well-nourished and free from hookworm and other diseases, such careless speculations need not be taken seriously by anyone. Even if it were true, we still need not get alarmed, in view of the way many examples of individual and social 'improvements' sponsored by busy people have turned out. Lethargy would be the lesser of the two evils. If the modern Detroit automobiles, for instance, are examples of improvements, we would be content with less of it. If Suburbia is another example, then indeed, we find the alternative quite alluring.

One phase of the argument against freedom from toil concerns itself with our supposed inability to defend ourselves against aggression if we should become 'soft and lazy.' This argument is on the assumption that there will be wars in the future and that their conduct will be carried in major part by foot soldiers slogging through mud (or sand, or jungle) — that is, that victory will depend on individual stamina and determination. That sort of warfare went out of use, if not out of fashion, with the introduction of machine guns and breech-loading artillery. It is hopelessly out of date now. We may as well become reconciled to the idea that international disputes must be settled by some means other than total war.

However, we are not accepting the proposition that freedom from toil will result in the people's becoming lazy and soft. They may loose some of their erstwhile belligerence and aggressiveness, developed through centuries of struggling against adversity, and they will lose that tired despondency that comes from long hours of toil at monotonous work; but they will have a degree of health and vitality which will preclude their becoming lethargic. Further, they will not be weakened and demoralized as responsible citizens by the rot of commercialism which pervades our society today.

Individual struggling against adversity may help to build certain prominent character traits, but we cannot think of any that would be of social benefit. However, if there does happen to be such traits, we contend that the human race had better find some less painful way of developing them or prepare to do without them.

A populace living without working will be a new experience for the human race. Always before, a society could carry only a small minority of its people on a non-working basis. Until recently, even the small children and the old folks had to work, particularly in the more advanced civilizations. In the Technate, only a small minority of the population will need to be employed at any one time. Machines and extraneous energy, supported by much improved designs of production, service, and living facilities, will eliminate toil from our society. The emphasis in the life of the

individual will be on Living rather than on making a living. The society itself — the social mechanism — will be highly organized and disciplined; it will need to be in order to provide freedom from toil for the individual citizens. But the people themselves will be freed from the rigors of production and service; yet, they shall have the privilege of consuming abundance. Theirs will be the freedom of social discipline, not the illusory freedom of economic anarchy.

This is the social state that we must orient our thinking toward and prepare for in our planning for the future. We must stop thinking of the virtue of work and think in terms of efficient, automatic production in factories without men. We must stop thinking about making jobs for human workers and turn to thinking about the elimination of human workers for sequences of work.

Freedom from work is not to be found within the framework of any political party, nor in the social objectives of any labor union, nor in the tenets of any ecclesiastical institution. It is inconsistent with the theory of American Free Enterprise, which insists on people earning a living through employment at jobs at the same time it continues to reduce costs with job-destroying technology; thus, Free Enterprise is hopelessly enmeshed in its own contradictions. Technocracy is antithetic to fascism, which, besides being extremely brutal in its operations, strictly regiments the lives of individuals and eulogizes toil. Technocracy is the opposite of Marxian communism in that it prepares for a worker-less society rather than a society of workers.

There is only one Destiny for North Americans. That is a destiny of abundance, security, and freedom from toil — in a Technate. **—Wilton Ivie, CHQ**

★ WASHINGTON—A physics professor said it is possible to meet 12% of the electric power needs of the United States by exploding two small hydrogen bombs in a specially designed chamber.

Dr. Jay Orear, assistant professor at Columbia University in New York, proposed walling off a section of a deep canyon, lining and roofing it with steel, insulating the chamber with dirt on top and setting off the bombs inside.

The idea was outlined in a paper prepared for a meeting of the American Physical Society. *—Associated Press*

Assignment of Responsibility

Physical operations in North America have reached the scale of magnitude which demands that administrative responsibility be assigned to the personnel whose training and aptitudes designate them as the most competent to direct the future course of society.

IONA ISLAND is a narrow mile-long tide flat at the mouth of the Fraser River on the southern perimeter of Vancouver, British Columbia. Because of its general industrial and agricultural unsuitability, its hundred acres or so have never been used during the 72-year history of this city whose metropolitan area now exceeds the half-million mark in population. Recently, however, it has been very much in the news on a controversial issue which still has not been settled. The suggestion was made that it be the site for a sewage disposal plant to enable an end to be put to the present practice of dumping raw sewage through a number of outlets into the river on the south and into English Bay and Burrard Inlet on the north.

The issue was brought sharply into focus this summer when, at the height of an exceptionally fine summer with thousands of citizens crowding the miles of beaches around the bay, a dirty word was mentioned that suddenly emptied said beaches. City health authorities, taking daily tests of the water's bacteriological count, announced that sewage had polluted it to an extent which made it unsafe for bathing or swimming purposes. 'Polluted' signs were posted along the entire shoreline, and an angry public seething with rage at being turned away from a favorite summer pastime was forced to examine the reasons behind the action that had been taken.

Now the battle of Iona Island wages. The City of Vancouver is determined to build at once the long-overdue disposal plant at its $8 million estimated cost, while neighboring Richmond Municipality is just as determined to block its construction on the grounds that it would only be a half-way measure. Contaminating raw sewage would still bypass its open pit in considerable volume

during stormy weather, and in a few years the whole job would have to be done over again.

Technocracy Inc. as usual takes no sides in this characteristic Price System squabble. We only point out that over twenty years ago engineers of the city public works department realized that the existing practice of dumping raw sewage into the growing community's surrounding waters must give way to a properly-designed disposal plant such as public health measures have already compelled a few other North American cities to install. A plant adequate to meet all disposal requirements was designed, but the project stopped right there. Political and financial wrangling over the ensuing years blocked construction, cost of which has since doubled. Vancouver as a result has the dubious honor of an internationally-known disgrace in her polluted beaches.

The sewage disposal problem is by no means unique to Canada's third largest city. Other cities as big or bigger are presently facing it, and are tackling it with greater or lesser success depending upon how urgently the problem has pressed upon them. In all such cases, technologists have known the solution but have been precluded from applying it because of financial and political restrictions imposed by their Price System bosses. Had these strictures been removed, it is a safe bet that the issue would not now be making news headlines across the Continent.

Technologists are facing a frustrating array of other physical problems on the North American scene — frustrating because they cannot implement the known solutions at all or else have to modify them seriously for temporary monetary expediency. The St. Lawrence Seaway and Tennessee Valley Authority afford two outstanding examples. Both are engineering triumphs as far as they go, but any hydrologist worthy of the name knows they fall far short of their potential.

The Seaway was built to accommodate vessels with drafts only up to twenty-seven feet which is adequate for the average freighter. Had it been deepened enough for forty-foot drafts, it would have accommodated any ship afloat. TVA has proved its effectiveness within its limited scope, but it is only a minor seg-

ment of the Continent-wide system of canal-connected rivers and lakes which **should** be providing deep water inland navigation from coast to coast and by supplying an inexhaustible volume of hydroelectric power. Anyone who has read the Technocracy pamphlet on its proposed Continental Hydrology will have a fuller understanding of the foregoing than can here be explained.

Despite North America's having over half of the world's fresh water supply, it has many regions today facing serious water shortages. There seems no likelihood of permanent solutions within the Price System, however aware competent hydrologists may be of their underlying reasons and of measures necessary to rectify them.

Some of North America's top technologists, disgusted at their political bosses' dilatory attitude toward vital domestic projects, are hiring out their talents in places where their qualifications are more appreciated. One such person is M. Harvey Slocum, designer of Grand Coulee Dam, who is now in India building a 740-foot high dam on the Sutlej River in the Himalayan foothills. Nearly two hundred feet higher than Grand Coulee, the Asian dam will (1) generate nearly a million kilowatts of electricity, and (2) irrigate ten million arid acres in Punjab and Rajputana provinces. Could Mr. Slocum have been induced to sell his know-how so far from home if projects as great or greater were being promoted in North America?

Technologists have devised, installed and operated the physical equipment which has provided our relatively high standard of living—compared with the rest of the world. Until now, however, they have been doing their work merely as employees carrying out the orders of political or business bosses, and accordingly could not overstep the limitations of available public funds or of profit motivations in any projects. They have never had the authority to initiate work they deemed necessary and to see projects through on scales most compatible with existing physical circumstances without having to consider the size of the price tag. This anomalous situation is no longer tolerable. Physical operations in North America have reached the scale of magnitude which de-

mands that administrative responsibility be assigned to the personnel whose training and aptitudes designate them as the most competent to direct the future course of society.

How can men of the necessary calibre be assured of selection?

First must come the elimination of interferences which have been thrown in the way of natural leadership selection. Many of these will automatically disappear with the forthcoming dissolution of the Price System. Following this will come a vast expansion of a procedure already used for selecting the most competent technical personnel for the top technical positions. This procedure, called 'vertical alignment promotion,' is indispensable in an industrial mechanism as complex as North America's, however badly sabotaged it may be today by the conflicting interests of management and labor.

Vertical alignment, simply put, is an appointive system of promotion with functional ability being the determining factor. Presume that in a certain factory a foreman's retirement gives rise to a vacancy for the job. The floor superintendent, familiar with its requirements and with the qualifications of the various men in the department concerned, appoints the one with the best functional record as the new foreman. Similarly, the floor superintendent himself would have been appointed by his technical superior, and so on up the ladder to the top rung of technical responsibility—each man having been appointed to his higher position by his superior. Who appointed the man on the top rung? In a Price System operation it would be the financial controllers of the company who knew his functional record by reputation if not by observation.

It has never been possible so far to apply this technique with maximum effectiveness because of the already-mentioned serious impeding by management and labor. One common form of sabotage exists in an employer maintaining a friend or relative in a position of technical responsibility beyond the person's functional ability that he might enjoy the job's comfortable salary. In such cases his deficiency must be compensated for by a lesser paid subordinate with the necessary training — a man whose initiative

would assure his promotion if natural selection were not subverted.

The vertical alignment structure is obstructed just as effectively from the other side of industry when a labor union prevents management from appointing the functionally most capable man for a certain job simply because he lacks the service seniority of another whose work is obviously of lesser calibre. Since the work to be done nevertheless demands the attention of the more competent man, the result is that he has to cover up the inadequacies of his nominal superior and, in effect, thus maintains the elements of vertical alignment selection of personnel. All he lacks is the operative authority of the position he is covering by proxy.

These interferences are symptomatic of the increasing difficulties our Price System society is encountering as it futilely attempts to cope with environmental conditions with which it is completely out of touch. Politics and business may have some claim to promoting technological progress on this Continent, but their mercenary motivations have been more of a hindrance than a help in the last forty years. Their haphazard methods are no longer dependable for choosing the personnel to operate the equipment providing our goods and services. Several million North Americans marking 'X' on a ballot opposite somebody's name is too apt to result in a lawyer with absolutely no knowledge of electricity being appointed public electrical power administrator. In this sixth decade of the Twentieth Century it is leaving too much to chance to make our administrative selections so recklessly. Henceforth, personnel must be appointed on the basis of demonstrated superior ability in specialized fields and be granted the authority to implement their knowledge for maximum social benefit. Only a society whose design automatically eliminates special privilege and operational interference — in short, a Technate—can fully achieve this objective.

The Technate design will employ vertical alignment promotion as an integral feature. Freed from the Price System hazard of differentiated incomes, it can then

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OBSERVATION - STUDY - ANALYSIS - REPORT.

RESEARCH BULLETIN

NOVEMBER, 1958 *Compiled by Editorial Staff* No. 114

Machines Keep Crops Too Big

THE U.S. farmer is harvesting two record-shattering crops this year:

• One is pouring from fields and feed lots—by far the biggest output of food and fiber ever. The flow should continue next year, too.

• The other is coming from the U.S. Treasury—an unprecedented flood of dollars paid to farmers, either to curtail production or to prop the prices of their products. Last fiscal year, the Dept. of Agriculture spent $4.9-billion for all its programs. This year, it expects to lay out just under $7-billion, and, under existing legislation, there's little chance that next year's spending will be any less.

Added up, this means a year of prosperity on the farm, at least for producers with enough land, knowhow, and machinery to take full advantage of the good growing weather. The only exceptions are areas such as the Old South cotton belt, hit by rigid production controls. Along with the farmers, some of the nation's makers of farm equipment have been thriving.

• **Changing Farms** — The abundance both of crops and of government cash can be attributed to swift advances in agricultural

technology. It's now possible for a farmer to raise bigger crops more cheaply than ever before. Because of all the help farmers now get from machines and fancy new methods, in many cases the government's acreage restrictions have made no dent on yields. Even with less land under cultivation, the farmer can harvest bigger crops.

The tricks of technology include experiments to stabilize soil and weather conditions; chemical fertilizers, insecticides, and weed-killers; and irrigation systems. Machines are doing more and more of the work—picking cotton, feeding livestock, harvesting spinach, picking and shelling beans. One mechanical harvester can pick and top radishes and ready them for washing.

There are also improvements in older types of machines, such as harvesters for wheat, corn, and other grains. For instance, one machine can now be used both to pick and shell corn. Tillage equipment has been upgraded; the latest models can plow, plant, or cultivate six to eight rows of field crops at once, instead of the two rows standard 10 years ago.

• **Automatic Hens** — Of course, many vegetable and fruit crops will be harvested by hand for a long time to come, usually because they don't all ripen at the same time. But farmers have found ways to modernize handling of these crops. Lettuce, for example, is now packed in the field into cardboard shipping boxes that are assembled, folded up, and stapled on the spot.

Pushbutton farming is on the way, too. Chickens can be fed and watered automatically, the chicken house can even be cleaned mechanically — by a series of sweeping blades. The idea is to keep the chickens tranquilized so that they will gain weight as quickly as possible. Techniques for feeding hogs and cattle are moving in the same direction.

There's also a trend toward luxury for the operators of the new machines. Hydraulic controls are already common. Now the makers boast refinements such as cigarette lighters, power steering, and air-conditioned cabs.

• **On Exhibit**—The best way to see how drastically technology has been changing the farm is to look at a few examples. Despite the wide variations in farming

practice, a few 'showcase' operations are recognized as top practitioners of the latest methods.

Farming Without Hands

In vegetable farming, machines have quietly usurped jobs formerly handled by whole crews of laborers. Partly as a result, the vegetable farm is increasingly a big business, requiring a lot of capital, land, and equipment.

Buurma Bros. in Celeryville, Ohio, is a case in point. On a 600-acre farm, Buurma Bros. raises onions, celery, potatoes, radishes, spinach, and lettuce with a crew of 125 to 165 men. In the last dozen years, machines have made it possible for the outfit nearly to double its operations without much of an increase in manpower. The new machines include:

- An onion cultivator that chops the weeds and loosens the soil around onion plants—a job once done by 20 field hands.
- A radish harvester that pulls the radishes from the ground, tops them, and loads them into a wagon ready for washing and grading.
- A radish line that automatically packages the radishes in polyethylene bags — and reduces the packing staff needed from 18 to 3.
- A potato digger that also loads the spuds onto waiting trucks.

- **Rich Investment** — Buurma Bros. can attest that it's expensive to mechanize vegetable growing. It has around $175,000 tied up in trucks, tractors, cultivators, and specialized machines. In addition, it owns 17 tenant houses, greenhouses covering three-fifths of an acre, and a cold storage house.

The Ohio operation is also intent on taking advantage of other improvements in farming. It has boosted output per acre about 25% over 10 years ago. Thanks in large measure to the new onion cultivator, it has tripled onion yield. It is better able to control weeds, disease, and insects. And irrigation and a new underground drainage system — costing $200 per acre—help free it from dependence on the weather's whim.

Lots of Lettuce

In the Far West and Florida, some large growers have specialized so completely that they plant vast irrigated tracts to a single vegetable crop. K. R. Nutting Co.'s 1,000-acre lettuce ranch near

Salinas, Calif., is one of these.

Probably the biggest postwar change in lettuce growing evident on Nutting's ranch is the switch to cooling in vacuum chambers. Formerly, ice was used. Vacuum cooling eliminates unwanted moisture that is apt to damage the lettuce. It brings the temperature down rapidly and uniformly. And it delivers better-looking lettuce to market.

No one has yet devised a machine that can thin, weed or harvest the lettuce plants. Because all lettuce heads don't ripen at the same time, they have to be cut selectively — and machines don't know how to make the choice. But huge crawler tractors are assigned to shape the raised seed beds and do other tilling and cultivating.

• **Streamlining the Work** — With manpower still important, the emphasis is on making the best possible use of every field hand. The operators try to handle the lettuce as little as possible during harvesting, to reduce both costs and damages. One crew moves down the rows to cut and trim the lettuce heads and place them on the ground. Another crew packs the lettuce into paperboard cartons, while a third gang seals the cartons and heaves them into waiting trucks.

A few years back the big grower such as Nutting tried to mechanize harvesting even more extensively. They used large $10,000 packaging machines that straddled 12 rows of lettuce. Harvest hands cut the heads and dumped them onto conveyor belts on the machine. A second crew of laborers, perched on the huge rig, packaged the lettuce as the machine moved through the field. This year, though, the machines have been discarded because growers found it too difficult to supervise packaging; too much substandard lettuce was going to market.

Nutting has had better luck with scientific farming tricks than with machines. Mainly because of disease-free seeds and more potent fertilizers and insecticides, the firm's average yield is now about 400 cartons per acre—compared with an average Salinas yield of 150 to 250 cartons in the 1930s. Last year, Nutting shipped 1,186 carloads of lettuce.

Oceans of Wheat

For farming on a really mammoth scale, look to wheat ranch-

ing. Typical of the biggest and best among wheat growers today is Vollmer & Bayne, which farm 15,000 acres in the semi-arid Horse Heaven Hills of Southeastern Washington.

On these Western wheat ranches, harvesting looks like Army maneuvers, with as many as 12 combines deployed in a single field. The combines are backed up by trucks hauling the grain, by service and repair crews, and by crews standing by to fight fire if it should break out in the fields. During harvest, the partners who run the ranch, C. G. Vollmer and G. L. Bayne, patrol the fields in radio-equipped station wagons, from which they scan operations through binoculars.

Their production has been soaring, largely because of the use of liquid ammonia as fertilizer since it was introduced in 1945. Potent and easy to apply, this substance has helped raise yield to 30 to 40 bu. per acre—against a long-term average of only about 12 bu. per acre for the area. If anhydrous ammonia is applied when there's too little moisture in the soil, it will burn out the wheat. But in good years, say Vollmer & Bayne, every $1 spent on fertilizer will return $3 to $4 in increased yield.

• **More Machinery**—To be a successful volume producer like Vollmer & Bayne, it takes a small army of equipment. These partners maintain $250,000 worth of machinery, including six crawler tractors, 12 combines, nine trucks, four pickups, two station wagons, and all sorts of weeding, cultivating and seeding equipment.

This machinery is getting bigger all the time. Size is an advantage on a wheat ranch of such scale. Bigger tractors, for instance, can haul more equipment for cultivating, plowing, and seeding. And in the dry, dusty hills, it's important to work the soil over as quickly as possible after a rain, to prevent the precious moisture from evaporating. The larger tractors make it possible to do this much faster, and this can mean the difference between a good crop and an only so-so one.

Between machines, new land, and improved farming methods, the business of growing cotton has also radically altered in the last 20 years. The yield has nearly doubled—and it's still climbing.

Twice As Much Cotton

Some of the most spectacular results have come in the Texas Panhandle, where cotton farmers now brag about yields of 625 to 750 lb. per acre—nearly twice the national average. Other farmers farther west — in New Mexico, Arizona, and California — are duplicating this performance.

The reasons include more powerful fertilizers and insecticides and improved seeds. The West Texas Agricultural Experiment Station at Lubbock has developed seed for West Texas farmers that produces cotton of uniform height. This makes it much easier to cultivate and pick mechanically.

• **Opening West Texas** — Cotton farming in West Texas began only 25 years ago when underground water reservoirs were tapped to irrigate the land and make farming possible. Since then, operations have been largely mechanized. For instance, Frank Gray, who farms about 650 acres of cotton outside Lubbock, owns eight tractors, one combine (for grain), 14 trailers, a spray rig, and all kinds of disc and pitch plows. In addition, he has two cotton strippers and plans for two more.

The cotton stripper is the only equipment designed specifically for the Texas plains. These devices remove the entire cotton boll from the plant, rather than just the cotton fiber and seeds as other cotton picking machines do. Gray still employs 150 to 200 field laborers to pick the best cotton by hand—usually from 40% to 60% of the total crop. Mechanical strippers do the rest.

• **Expensive Machines** — Other than in West Texas, where picking practices are different, mechanical cotton harvesters are in heavy demand again after a drastic shrinkage in sales in the last few years. These machines, designed to pluck the entire cotton crop, cost $10,000 to $15,000, but they can outpick 40 to 70 toiling field hands. Sales slumped after government restrictions reduced acreage and made it cheaper to hand pick the cotton. But a recent sharp rise in the cost of farm labor has reversed the trend.

The Hens Have It Easy

The most automated operations of all on today's farms are the chicken factories.

On the Wrenn Bros. farm near Momence, Ill., for example, al-

most everything except actually laying the eggs is done for the chickens automatically. They are seldom disturbed by human intrusion. The only person who ever visits them is a custodian, but they have been so conditioned to noise by glaring radios that they are probably unaware of his presence half the time.

When not producing eggs, the chickens cluster on wire decks around the central feeding areas. To quench their thirst, they can peck all the water they want from slow-dripping faucets that never go dry. Sliding blades under their perch clean the floor automatically. Antibiotics are added to their feed — also automatically— to keep them in prime condition.

In only two hours or so of work a day, one man can tend the 6,000 birds. Last year, the operators produced 70,000 doz. eggs. This year, by adding a few hundred more chickens, they expect to up the figures to 85,000 doz.

• **The Same for Cattle**—Livestock operators—including the Wrenn Bros. themselves — are applying some of the same techniques to feeding. The Wrenns keep their steers on paved lots, with scraper systems to keep the premises clean automatically. Bunk-line wagons mix and deliver the feed as they move alongside the lot.

Other farmers are using special silos that, with the flick of a push-button, send feed straight to the feed lot by conveyor.

The feeds themselves are also drawing attention. To reduce nutrient loss and spoilage during storage, there are crop dryers, machines to turn hay into pellets, glass-lined silos, and plastic silo and feed covers. To fatten the cattle more quickly feed is enriched with stilbestrol, a female sex hormone, and with antibiotics and other supplements.

Thanks to tricks such as these, J. P. Gannon and W. P. Gannon, for example, have doubled their beef and milk herds and boosted crop output one-third on their 687-acre farm outside Des Moines. At the same time, they need one less man on the place.

• **Birthplaces for Hogs** — Hog farming is changing, too. One system for controlling the hog's environment — in which sows give birth in isolated units rather than in a common farrowing shed — is already on the market. According to tests, these units have re-

duced the infant pig mortality rate by crushing from 14% to 2%, disease loss even more. They also cut the farmer's work in half.

Surpluses Still Pile Up

By using all these techniques, the U.S. farmer has continued to expand his production despite government attempts to control output. It's becoming embarrassingly obvious that some different sort of approach is needed to control the surpluses.

Even the most ardent Congressional supporters of the acreage allotment program admit it isn't working. The theory was that in return for price supports, farmers would agree to limit acreage. But the limits imposed by Congress and Agriculture Secy. Ezra Benson were never sufficient to offset the increases in yields made possible by technology.

Under present farm laws, only bad weather can hold production down. This year, corn crops are up 5% over last year, oats 8%, sorghum grains 3%, barley 7%, soybeans 17%, rice 11%, and wheat—thanks to the breaking of a drought—53%. Cotton output is up about 1-million bales over 1957.

• **Fewer Farmers, More Crops**—While production has shot up 21% in a decade, the number of acres in cultivation has dropped 6%. This year's record crops will be harvested from the fewest acres in 40 years. The labor needed to bring in this crop is estimated at 13.5-billion hours—the lowest on record, down 21% since 1947-49. There's little hint next year will be any different:

• The wheat carryover next year, for example, will be around 1.3-million bu. That's enough to supply all the nation's domestic and export needs for a year with 300-million bu. left over—even if farmers didn't raise a single additional bushel in 1959.

• Feed grains — such as corn, oats, and sorghums—have already piled up in the biggest surplus ever. But crops continue at record volumes.

Next year should end with banner yields—and banner surpluses. Federal payments to farmers should also continue high. Congress is not likely to return for its next session in any mood to deprive farmers of their payments from the Treasury. Prices may average somewhat lower than this year, but the

dollar total will remain high because this year's peak output will be going to market in 1959.

• **New Policy**—Despite the record crops, no one is really rejoicing, because there's no sign at all that overproduction — agriculture's basic disease since World War II —has been controlled. In the key price-supported crops of wheat and corn, much of this year's output will simply wind up in the hands of the Commodity Credit Corp.

It seems certain that the dilemma will force a new set of farm policies on Washington shortly. These new policies are likely to be in the direction already pointed by Secy. Benson—fewer production controls and lower price supports. The hope would be that this would lead to the development of more efficient farm producers, big enough to avail themselves of all the technological advances—and strong enough to get along without subsidies.

—Business Week

EDITOR'S NOTE: This article on the improved technology which has enabled farmers to raise more on even less land is not news to Technocrats. It confirms what Technocracy Inc. has been telling the citizens of this Continent these many years. Technology is on the march in the fields as well as the factories and as it advances it creates a greater and greater abundance of goods. The impact of technology and plenty on the Price System and political government will be the big economic story of the next few years. Politicians, businessmen, farmers and other North Americans will have to learn the hard way that there is no real solution to the problem of surpluses under the present system. Only Technocracy Inc. has devised a social system that will permit the machines to produce an abundance which will then be distributed to all the people without politics or price.

★ VANCOUVER—Automatic instead of manual control will cut operation costs of British Columbia Electric's Port Mann turbine plant by 30%, a company official said.

Tom Ingledow, BCE vice-president, said the saving would be effected by the use of a remote control system.

The plant, due to be completed early in 1959, will be the world's largest gas turbine electrical plant and the first to incorporate the remote control system.

BCE expert T. D. Stanley said public utility operations must pay increasing attention to automation as a weapon against rising costs. —*Canadian Press*

A Million Jobs Have Gone

WASHINGTON—Amid all the politically-inspired talk about the end of the recession, one serious fact has been soft-pedalled by the Eisenhower administration.

The United States has pulled itself up out of the recession (and apparently on an inflationary ladder) but in the process about 1,750,000 jobs have literally disappeared.

U.S. government economists point out that about 2,000,000 jobs were lost during the recent year's 'economic downturn' and around 250,000 have been recovered. More of these jobs will be re-opened as things improve this fall, but these officials admit, possibly as many as 1,000,000 of these jobs may have disappeared for good.

This trend has been growing for some time now. The Wall Street Journal recently worked out the statistics, using government figures, and found that 11,900,000 American workers are now turning out 35% more than 12,700,000 workers did in 1948. That means there are 6% fewer jobs in factories than there were 10 years ago, but that those factories are 35% more efficient.

It is not surprising in view of this to see that although the U.S. gross national product is climbing to new peaks, as Republican campaigners happily pointed out, unemployment, as of September, was 7.2%, compared to 4.5% a year ago. In terms of men and women, that meant there were still 4,500,000 people unemployed in the prosperous United States.

AFL-CIO president George Meany, in commenting on this extraordinary percentage of unemployed, noted that the September figure had only been exceeded in four other months in the past 16 years.

Mr. Meany pointed out that, while industrial production has recovered by almost 70% from the depths of the recession, 'only 19% of the loss of manufacturing jobs has been regained, and only 25% of the loss of total non-farm jobs has been regained.' There has been a very sharp rise in productivity, he added, and this has been reflected in the boom on Wall Street.

As the Wall Street Journal summed up this trend, 'output of U.S. factories has expanded more than a third as much in the past 10 years as in all the previous years of American history combined.'

What has caused this?

Two factors are given by experts in this field. The modernization, especially automation, of industries and the shift of workers into service industries, non-industrial or government work.

The U.S. government, strangly enough keeps no figures on the amount of automation that has taken place in the country in the past decade, during which automation has become a major economic factor. Perhaps it wants to avoid giving ammunition to unions which fought change.

A study of automation by Joint Economic Committee of Congress found automation growing in the metal working industries, the auto industry, the banking industry, in warehouses and even in retailing.

A recent survey by McGraw-Hill Publishing Company for its industry clients showed that, while industrial machinery sales are booming, less than one-third of recent manufacturing facilities has been bought since 1950, and less than half of this could be included in the automation category. In fact, the report suggests that two-thirds of all manufacturing equipment in the U.S. is now old enough to be replaced by modern machines. And the new machines are estimated to produce 40% per man more than those installed in 1948.

All this change is not going to happen over night, say the economists, because it is so costly and because much of the obsolescent machinery is in small plants. But as it does it will keep the U.S. unemployment figures high.

A continuing canker sore of jobless, numbering upwards of 4,000,000, is going to make political trouble. Labor unions will be demanding the shorter work week, perhaps some controls on automation. Administrations will be faced with demands for assistance to areas of unemployment.

But somehow this country is going to have to find a way to solve the problem of the disappearing jobs. **—Southam News Service**

A TINY ELECTRONIC REFRIGERATOR can reduce the temperature of sensitive electronic instrument components by 50 degrees. Developed by Nortronics Division of Northrop Aircraft Inc., it is one of the first industrial applications of the Peltier effect—the same principle used by Westinghouse Electric Corp. for experimental heating-cooling devices without moving parts.

What happens is this: An electric current is passed across the junction of a loop connecting two dissimilar metals. One junction becomes hot, the other cold. The cold junction is then used to draw heat from the electronic components, which operate best at low temperatures.

A NEW SYNTHETIC RUBBER called cispolybutadiene stands 40% more wear than natural rubber on truck and passenger car tires, according to tests conducted by Armstrong Rubber Co. and Phillips Petroleum Co. The new rubber, in pilot production at Phillips, probably will be less expensive than the isoprene-based rubbers—up to now the only synthetics able to resist the damaging build-up of heat in truck tires.

A PAPER TEXTILE THAT CAN BE used in place of traditional textiles for garments, hand towels, medical gowns, and a wide variety of other products has been developed by the Scott Paper Co., Chester, Pa. The material, called Dura-Weve, is a laminate of rayon and two or more piles of wet strength paper. The make-up can be varied by substituting for the rayon other materials such as plastics.

A STEEL PLATE CUTTER THAT 'reads' blueprints and guides the cutting torches accordingly has been developed by Aerojet-General Corp. The U.S. firm says that the device can reduce labor costs in plate-cutting as much as 70% in the shipbuilding industry, where it is still common practice to mark out and cut hull plates by hand. Sensing devices also keep the cutting torches at their most efficient height.

A HIGH TEMPERATURE ALLOY called Rene 41 has been developed by General Electric Co. Intended for sheet-metal use, it is a titanium-aluminum, nickel base material that can be used from room temperature to the 1800F range. It was designed for severely stressed jet engine components, but GE says it's also suitable for afterburner parts, turbine casings, and the like.

MOVIE CAMERAS CONTINUE TO go automatic. Revere Camera Co., Chicago, now has brought out a line of eight-millimetre cameras that are automatically set by an electronic device for computing and controlling exposure. These Electric Eye-Match cameras also include a special effects control allowing professional-type fades and deliberate under and over exposures.

A NEW ELECTROSTATIC PRINTER called the Copytron turns out microfilm enlargements at a rate of four a minute. In one step, this dry printing process blows up 35-millimeter microfilm to as much as 18 by 24 inches. Charles Bruning Co. Inc. of Chicago makes the unit for sale at $9750 or lease at $280 a month.

(*Continued from Page* 20)

be used to its fullest potential in all phases of the social operation. The inevitable result will be the natural selection of the most competent personnel for the most responsible functions.

How this would occur may be described through the medium of transportation, a function which daily affects all citizens' lives in some aspect or other. For convenience s a k e this operational sequence may be divided into its four chief categories — railway, highway, water and air. It is axiomatic that if they are to be most effective they must complement each other rather than be treated as separate and competing entities as usually pertains today. This observation does not overlook the fact that some of the major transportation companies u t i l i z e all four media, for they are used in a manner to produce the greatest dollar gain—an objective not necessarily in conformity with most efficient transportation service. Such a result can only be produced where maximum service is the only criterion of operation, and where all ingredients are accordingly brought together under a unified control. These are the major factors to be considered in appointing the most competent personnel to direct that unified control. Here is where unimpeded vertical alignment promotion will prove its incalculable worth.

Some pertinent modifying considerations must be remembered in connection with the operating characteristics of vertical alignment promotion. A m o n e y less society with e q u a l consuming privileges for all citizens will, for instance, permit a supervisor to make his appointments purely on the basis of the functional ability of potential candidates. He will not be swayed by personal sentiments, for the results of a bad decision would reflect detrimentally on his own supervisory efficiency and chance for promotion. Nor would a person likely seek appointment to a job which demanded greater capabilities than his own, mainly because of the deterring loss of prestige following a necessary demotion. On the other hand, a man whose instinct for workmanship manifested itself in an exceptionally high degree of competence would not need to seek such appointment. His superior calibre would soon become so evident as to constitute

its own recommendation for promotion with its commensurate gain in social prestige.

What effect would these considerations have in the selection of top operating personnel in the Technate's transportation sequence?

We will take the case of a person commencing his twenty years' functional service on his twenty-fifth birthday. Several years prior to this while travelling about the Continent as a student he found himself more intrigued with transportation matters than with any other function observed. Consequently, from then on he specialized in this branch of education with railroading as his major interest. By the time he was ready to enter his functional service he had a good general understanding of the entire operation, not only in theory but also in the practical experience gained in yards, shops and train service.

Starting his functional service as a locomotive engineer's assistant, he soon demonstrates sufficient knowledge of the locomotive's design to recommend certain changes for improved operation. Experimentation proves his ideas sound so they are put into effect and he is promoted to full engineer. In this capacity he makes further recommendations for locomotive improvement, inter-train communications, signal systems, freight car designs for faster loading and unloading, and various other ideas. Each time he provides diagrams and detailed specifications of his recommended changes in a manner which favorably impresses his superiors who adopt most of his suggestions. His unquestioned ability wins his promotion to the division of design and construction where he further distinguishes himself. He climbs steadily up the ladder of vertical alignment assuming ever greater responsibilities until he reaches the top rung of functional authority in railroad transportation. He is voted to this position by his immediate associates who alone are competent to make so important a selection.

Top functionaries of the other three categories were selected similarly, and now, because the director of the entire transportation sequence has retired, a new one must be appointed. Our man, who has long recognized the need for a close integration of all trans-

portation branches and has made numerous adopted recommendations in that direction, appears as the best qualified candidate. His name is submitted to the Continental Control Board who accept the recommendation and appoint him as the new director of the transportation sequence. By virtue of this appointment he also becomes a member of the Continental Control which comprises the directors of all functional sequences on the Continent, all of whom attained their places by the same demonstration of superior ability as he had displayed in transportation.

The functional governance of the North American Technate will consist, then, of highly competent specialists in all aspects of social operation. Transportation will be headed by a transportation specialist, communications by a communications specialist, and so on through education, public health, agriculture and the rest of the ninety or more functional sequences which would attend the industrial and service needs of the populace. Whether sought or not, considerable genuine social prestige would naturally accrue to these men of the Continental Control, with the biggest share going to the Continental Director as chairman and top coordinator. He would be elected to that highest position of responsibility from the ranks of the Continental Control Board by a two-thirds majority vote of its members who would use the usual criterion of outstanding ability as their guide.

Most of the seemingly insurmountable physical problems which plague us today would shrink to insignificance when subjected to the scrutiny of this calibre of responsible leadership. The question of sewage disposal such as referred to earlier would simply be reduced to its elements —recognition of the need for a disposal plant; planning an adequate one for all current and foreseeable future requirements; and the immediate construction thereof without encountering irritating Price System interferences.

Technologists who have not sold out their intellectual integrity to their Price System bosses are aware that their importance to society is increasing with every new installation of automatic equipment and with

every boost in the rate of energy conversion. They know that without their technical knowledge there could be no high speed industrial technology, despite their having to take back seats in the Price System operation of it. Many are beginning to see the growing danger of allowing technically untrained politicians and businessmen to direct the course of society in an advanced technological environment, and some are beginning to realize they have been unduly slow in recognizing their indispensable social roles.

The steadily mounting pressure of events is dealing lethal blows to an already punch-drunk Price System. It is reeling under the impact of abundance wrought by a too provident technology, and must soon be supplanted by the functional governance of the North American Technate. Once it is established its built-in design will assure that the most competent men are assigned to positions of most responsible authority, resulting in the most efficient operation of the Continent's physical equipment to achieve the optimum standard of living for all citizens.

Meanwhile, you as a North American citizen have a major assignment to carry out. As a measure of personal survival you must prepare yourself to direct your fellow North Americans toward the Technate when the Price System becomes inoperable. This means a rather rigorous educational program. Technocracy Inc. stands ready to explain the reasons for the Price System's failure in present day North America, and why only a blueprint of social operations such as this Organization has formulated will suffice.

If you do your part in seeing that the 'next most probable state of society' becomes a certainty rather than merely a probability, you may depend upon our functionally-trained personnel to follow through most favorably on the mandate thus granted them. To see that this is accomplished is your personal assignment of responsibility.

—Rupert N. Urquhart

★ LONDON—Three atomic reactors have been installed in the Russian nuclear-power icebreaker Lenin, now nearing completion, Moscow radio has reported.

The Day the Taps Run Dry

Water—our most carelessly wasted resource—is fast becoming our most precious one. Already it sets the limit for growth of many cities and industries . . . and nobody is yet doing anything effective to prevent a real catastrophe in the years ahead.

IF THERE is one thing which the ordinary American city-dweller never thinks about from one end of the year to the other, it is water. He turns on the taps, and water pours; he turns off the tap incompletely, and it drips; he flushes the toilet, and it roars. Every so often, some politician or city planner makes a speech warning people not to waste water, but nobody pays much attention. To most Americans today, pure, palatable water in unlimited quantities is a kind of birthright, like citizenship, and not even the Supreme Court can ever take it away.

No following generation of Americans is ever likely to share this luxurious attitude. We are rapidly running out of good water. More than a thousand cities and towns already have been forced to curtail their water service. Near Chicago, where artesian wells flowed under their own pressure a hundred years ago, new wells must go down 2,000 feet to reach the water table. Dallas is already pumping the salt-tainted Red River into its mains, and New York faces the likelihood that eventually it will have to purify the polluted Hudson to slake its growing thirst. In Mississippi, wells are now 400 feet deeper, on the average, than they were only ten years ago. Denver, eager for new industry, has been turning away manufacturers whose production processes involve a heavy use of water.

All along the Atlantic Coast, as the water table falls, the ocean is pushing in to the underground reservoirs. In Dade County, around Miami, high salt content in the wells threatens the crops on irrigated farms. Inland, oilfield brines often seep into the deep wells. Marianna, Arkansas, tastes salt when it turns on the tap, and one Texas community

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was forced to drill three dozen new wells in a single year. When headwaters are piped off to the reservoirs, the rivers fall: in the summer of 1957 swimmers waded across the Delaware at the point where General Washington took his famous ferry ride.

A large, rich suburb of New York has already experienced the ultimate horror. On October 29, 1957, the city reservoir of Orange, New Jersey, became a muddy hole; and two days later, one of the city's four artesian wells ran dry. Orange turned desperately to the state of New Jersey for help, which was forthcoming—but only after the city had pledged to reduce its consumption by 500,000 gallons a day.

Water shortages, obviously, can be caused by either of two things: too much consumption or too little supply. Both are operating in America today. Our demand for water is increasing at a fantastic rate, and we are channeling our resources to meet our needs at far less than maximum efficiency.

According to the latest report from the United States Geological Survey, our farms, homes, and factories are drawing 240 billion gallons a day from the nation's streams, reservoirs, and underground storage. Of the total roughly 10 per cent goes into homes for drinking, washing, and sprinkling the lawns. The rest is divided more or less equally between farms and factories.

Sixty years ago, the average household used ninety gallons of water per head each day. Today we have 35 million bathrooms, we buy millions of dish washers and washing machines, air conditioners and automatic lawn sprinklers — and the per capita use of water has risen to 148 gallons a day. El Centro, California, which would be miserably uncomfortable without air conditioning (summer temperatures rise to 115 degrees) holds the world's record for domestic water use—600 gallons a person a day. And while consumption per capita goes up, our population is rapidly rising, currently at the rate of three million a year.

The increase in domestic water consumption, however, is small beside the growing thirst of commerce. American industry now uses 110 billion gallons of water a day—eleven times as much as

it used in 1900, and almost half again as much as it used in 1952.

Nearly all manufacturing requires **some** water, and many processes demand amazing amounts. A new oil refinery in Delaware takes in as much water as a city of two million people. Each ton of paper drinks 65,000 gallons. Steam plants for producing electric power consume 91 gallons for every kilowatt-hour sent out on the lines. Gunpowder costs 100 gallons of water a pound.

With the depletion of high-grade iron ores in the Mesabi Range of Minnesota, the emphasis is shifting to taconite processing, a procedure which demands three times the water used at present in that district. And the new plastic and atomic industries are the worst water hogs of all. By 1975, unless manufacturers cut down their water consumption, our factories alone will tap 275 billion gallons a day—if they can find it.

On the farms, irrigation canals and pipelines are stretching out farther every year. Some 34 million acres of farmland in this country are artificially watered by one means or another, and the practice is rapidly spreading from the dry West—where irrigation has reclaimed great stretches of previously useless land—to the more humid East. Recurrent droughts in Eastern farm areas since the war, plus the development of more efficient pumping equipment and lightweight pipes, have led to a fourfold increase in the amount of irrigated land on the Atlantic side of the Mississippi. In Indiana, where there were less than 5,000 acres of irrigated land in 1950, there are now 25,000, and farm experts foresee an increase to 80,000 by 1965.

In the West, too, more and more water is being demanded of the earth. In 1941, 420,000 acre-feet of water were pumped out of the ground in Santa Cruz valley, Arizona; by 1949, withdrawals had reached the rate of 1,250,000 acre-feet a year. (An acre-foot is the amount of water necessary to cover one acre to a depth of one foot.) During this period, rainfall replenished the underground reservoirs at the rate of only 215,000 acre-feet a year. On the high plains of Texas, men are pumping up the underground water reserves **twenty-**times as fast as nature can replenish them. To this kind of

arithmetic, there must be an end.

We have long ceased to live on our water 'income'—the annual rainfall. Today we are drawing heavily on our water 'capital,' the underground reservoirs built up by natural processes over thousands of years.

In fact, of course, the situation is not so hopeless as the statement sounds. Our water income actually far exceeds our needs—if only we could channel all of it to our spigots. The average daily rainfall onto the United States is considerably more than the 240 billion gallons we withdraw. But most of that rainfall runs off to the sea without ever passing through a water main.

Water is available for our use only during that relatively brief time between its fall from the heavens and its arrival in the oceans. The more rapidly it runs off, the less of it we have.

Forested watersheds hold great quantities of rainfall—an inch of water in every four inches of humus—and release it slowly to the streams and rivers and underground reservoirs. Cut-over forest land holds little water; the rainfall runs off it quickly, in soil-destroying, gulley-digging torrents.

We have already sheared off most of the 822 million acres of virgin forest we found in this country, destroying the sponge-like forest floor which held back the run-off. And the suicidal process continues. Some large timber and paper companies today practice a highly publicized form of good forestry on their own lands, but many of these still overcut the small farmer's woodlot or timberland, let to them on contract. Dr. McArdle of the U.S. Forest Service classifies most of today's cutting as 'far from good.'

Water is held for future use not only by the 'plant robe' which normally covers the ground, but also by certain natural reservoirs, especially swamps and marshes. Here, again, we have been abusing our heritage. More than 82 million acres of swamps have been drained for farmland, and millions more have been covered over with housing developments. Springs and creeks have been bulldozed out of existence.

Another kind of natural reservoir is the aquifer — an underground deposit of rain water which has, through the course

of ages, seeped through the soil and porous stone until it is trapped by an impervious layer of rock. Some aquifers are like oil fields; they can be tapped by wells — and once drained, the water cannot be replenished within any foreseeable period. Others are like great liquid lungs, breathing water both in and out; they soak up the surface moisture and release it gradually to streams and rivers—thus helping to keep the flow of our water courses relatively stable.

This complex system is being interfered with nearly everywhere in the United States, with results that are as dangerous as they are hard to see. Many aquifers are being drained faster than they can be replenished. Elsewhere the natural supply of water to those underground storage tanks is being curtailed — by new highways, parking lots, air fields, and other construction which is spreading over hundreds of thousands of acres. It isn't possible to recharge a water table through six inches of concrete. An overgrazed pasture or cut-over forest, where the rainfall runs off immediately instead of soaking in, starves the underground reservoirs in much the same way.

In a few localities, as we have shown, so much fresh water has been pumped out of the ground that it has, in effect, left one of those vacuums which nature traditionally abhors. As a result, salt water has crept in from the sea, through deep-buried layers of porous sand or rock — and wells in some parts of California and along the Atlantic coast have begun to pump worse-than-useless brine.

Most of us, of course, still depend for the greater part of our water on surface streams, rather than the vaults of the aquifers. But it has been an immemorial habit of human beings not only to drink out of streams, but also to dump their sewage and other wastes in the same place. This was tolerable so long as the country was sparsely settled—but today it has become so crowded that virtually all of our streams are polluted to the point where they are suspect for human consumption unless chemically treated. Already many Americans are drinking what may be accurately — if disgustingly — described as treated sewage.

Damage done over a century cannot be repaired in a year or two. Even the most immediate, thorough, and expensive national water program would not deliver its benefits for ten to twenty years. Since we have no such program—Washington hasn't yet begun even to draft one — we resign ourselves to at least a generation of relative water shortage in the land of plenty.

There are palliatives, very well in their place, so long as we do not regard them as solutions. We can drastically reduce water waste by consumers. Peeping Tom statisticians say that we use three times as much water as we need for our morning shower. Leaky taps, which waste, could be made a misdemeanor punishable by a stiff fine. One modern luxury we can easily do without is the private swimming pool in the back yard; lots of us may be able to afford it economically, but hydrologically it is too expensive.

Water engineers are unanimous in their opinion that both waste and consumption would decline sharply if households and factories had to pay for their water by the gallon, rather than on the usual franchise basis. Water rates should be eliminated everywhere from the general real-estate tax package, and meters should be installed to measure and charge for water according to the amount used.

On the farm, too, water economies can be achieved. Open irrigation ditches lose water through seepage, vegetation along the banks, and the inevitable evaporation. Water is saved wherever pipes are substituted for ditches. Out in the range area, where water is scarcest, underground reservoirs are being drained needlessly, either to establish 'prior use' under Western laws, or as part of ill-advised reclamation projects.

Industry, however — which is guilty of the greatest waste — could accomplish the greatest savings. Steel mills require, on an average, 65,000 gallons of water to make a ton of steel; but in California, where water is tight, the inappropriately named Fontana Mills have learned to make do with 1,000 gallons per ton. Again, steam generating plants ordinarily use 91 gallons for each kilowatt-hour of electricity produced, but power plants in areas hard pressed for water turn out

the same current with one-tenth the water consumption.

Most industrial use does not pollute water to the point where it must be poured out to sea. Many factories could re-use over and over again much of the water that goes through their pipes. Even sea water can be used in certain operations, and a Texas refinery has contracted with the city of Amarillo for a supply of used water from the sewage disposal plant.

As yet, however, only one tenth of one per cent of the water used by industry is reclaimed sewage. Literally billions of gallons of safe, pure water could be saved every day, if industry would where possible content itself with water good enough for factories but not good enough for human beings.

On the supply side, too, temporary improvements can be wangled from nature. Where the aquifer has been contaminated with salt water, artificial recharging may keep the wells in business for a few more years. It may eventually be possible to recharge some depleted underground reservoirs by the diversion of flood waters—though no such experiment has yet fully succeeded, despite many theoretical discussions in hydraulic engineering journals. Cloud seeding may enable us to divert to the land some of the rain that now falls on the ocean. River pollution can and should be reduced. And, of course, great dams, artificial reservoirs, and aqueducts will keep increasing our apparent supply of water. Dramatic as they are, however, surface reservoirs make poor substitutes for natural subterranean storage vaults: evaporation loss is high, and silt accumulates rapidly, cutting down the storage capacity.

If the day ever comes when nuclear energy can provide cheap power in unlimited quantities, we may be able to handle our water problems by distilling sea water or by irradiating great quantities of sewage. But neither of these alternatives is currently practical —or pleasant to think about, at best. Indeed, they may well create more sinister situations than they solve.

There is only one way to avoid a water crisis in the coming years: a national water policy carried out on all levels of government, and including new mea-

sures of reforestation and conservation. We must slow down that part of the water cycle between the cloud and the sea, during which water is available to us. We must regulate our water use instead of merely supplying water to all and sundry on a catch-as-catch-can basis.

Experiments have verified the long-term value of reforestation. In the White Hollow Watershed of Tennessee the Forest Service permitted 1,700 acres of badly treated land to revert to nature. Where the land was gullied, the Service planted trees. Fifteen years later, severe summer storms no longer started torrents rushing down the hillside. Instead, the water flowed off evenly, at one-tenth the speed. The total amount of water coming down from the hillside after a one-inch summer rainfall was the same—but the streams ran full for ten times as many days.

Every protected swamp, every untouched woods, every revived forest adds to the water-holding capacity of the land. And the land cover can be made more efficient by sound watershed engineering —building a small reservoir in an upland hollow, controlling a disintegrating gully, dredging rivers, constructing floodways, stabilizing stream banks, creating a peaceful rather than a violent landscape.

Such engineering has already begun under the Watershed Protection and Flood Control Acts of 1954 and 1956. These laws give the federal Soil Conservation Service a modest budget for technical advice and assistance to local groups planning watershed improvements. But a great deal more legislation will be necessary before federal help is really an important factor in water-short areas.

At present, no fewer than twenty-five different federal agencies deal with some phase of the water problem — flood control, reclamation, navigation, water pollution, and so forth. All of them do valuable work, but each operates independently, with its eye on its own specialized chore. No agency in the federal government is concerned with water policy **as a whole;** indeed, the federal government historically has shown little concern over the total quantity of water available to homes, farms, and factories. We need, first of all, an

act of Congress establishing a national water policy, and perhaps an independent agency to turn that policy into a program.

Even the most rigorous national policy, however, will leave most of the actual work of water conservation and control to the state governments. A few of them are already busy on the job, most notably California, where the crush of population threatens a water calamity. California's master plan, which contemplates a population of 40 million, calls for the construction of 200 reservoirs and an aqueduct system, the entire project to cost $8.6 **billion** at current prices. Iowa and Pennsylvania, too, have assumed statewide authority over water development, and New York has reserved a state veto power over all new water systems. (New York also has vast state forest preserves, protecting its main watersheds.)

Often, several states draw water from the same basin. Today they squabble with each other about their withdrawal rights — the dispute between Arizona and California over the water in the Colorado River is a recurrent feature of the Supreme Court calendar. Eventually, however, they will have to learn to work with each other, to protect the watersheds and safeguard the joint supply. **Incodel,** which administers the Delaware River and its headwaters, is a functioning example of what the states — in this case, New York, New Jersey, and Pennsylvania — can accomplish together once they understand their joint interests.

Meanwhile, the municipalities, cities, towns, and villages, must recognize their obligations. Water supply is a regional, not a local problem. There can be little progress in water planning so long as every incorporated entity seeks out its own private waterhole. Under the supervision of state authorities, whole clusters of communities should be planning, building, and operating their common water supply systems.

Co-operation, supervision, and control are the key words. On every level, there must be a stop to the haphazard hijacking of convenient water. Until we learn to ignore artificial boundaries — to see that the watershed, not the user community, is the central element—we cannot hope to plan a future free of water shortages.

In a few areas, water scarcity is already a hindrance to progress. Plans to process oil shale deposits in Colorado may well founder for lack of water. Out on the edges of the great Western range, the desert creeps further into the grassland every year.

Most communities, though, have scarcely felt the pinch as yet. There is no great hardship, after all, in a temporary ordinance—common, these days, in Eastern cities — which forbids people to water their lawns except after dark. But these bits and pieces of municipal law foreshadow a cramped future, unless we act sensibly and soon to avoid a real crisis.

Led by Dr. Paul Sears of Yale, ecologists have been warning us for years about the danger to civilization inherent in a falling water table. There are ancient waterworks under the Sahara. Among the greatest monuments left behind by the dead nations of antiquity are the aqueducts—notably in Italy, Spain, and the Middle East—which multiplied as a failing civilization out-grew its water supplies. Our ingenuity has stripped the ground cover and dried the land infinitely faster than our ancestors could manage such destruction. We must now use that ingenuity to conserve and restore the balance of nature.

Without such ingenuity, without a well-financed, well-conceived national water program, we will inevitably drink our way into a water famine. And it will be too late to plan America's future on the day the taps run dry.

EDITOR'S NOTE: No political government, operating under the restrictions of the Price System, is prepared to undertake the drastic measures which will guarantee an abundant water supply for the citizens of this Continent. Only when they remove the interferences of politics and price, will the people of North America be able to install a Continental hydrology system which will provide plenty of water for domestic and industrial needs as well as develop our vast potential of hydro-electric power, raise the water table, irrigate millions of arid acres and establish a waterways network for cheap transportation from the Atlantic to the Pacific and from the Arctic to the Gulf of Mexico. Such a system has already been designed by Technocracy Inc.

Distribution Puzzle

We undoubtedly have the means and the know-how to produce an abundance of all the material things we need. However, we have not only failed to solve the problems of distribution, but over the last several decades have been moving in the wrong direction. *wrong direction.*

HERE IN Vancouver the chain stores are charging 25 cents a pound for tomatoes. Like the peaches I mentioned a few days ago, these tomatoes are American-grown. They are the same kind that you can buy in the winter—small, hard and pinkish. They come in nice little packages —handy but expensive.

Now I don't know what those nice, big juicy crimson red beefsteak tomatoes are selling for up the interior of B.C. right now. For even in the blessed Okanagan valley there are some mysteries too deep for me. This summer, at the very height of the tomato season, there were for a while just no tomatoes available at the stores in our town. Yet in that very same week the 'No Pick' order had gone out to the tomato growers in the Oliver region.

My point is that here in Canada we have not even begun to solve the problem that is at the very heart of the recurrent and constantly compounding economic crisis of our times.

The so-called 'free world' has in fact solved the problems of p r o d u c t i o n. We undoubtedly have the means and the know-how to produce an abundance of all the material things we need for truly abundant living in Canada.

But let us admit it candidly. We have not only failed to solve the problems of distribution, but over the past several decades we have been moving further and further in the wrong direction. Things have gone from bad to worse.

Measured by m a n - h o u r s of work the cost of production has been lowered year by year. For example, all across Canada there are f a r m s with perhaps three adults on them—maybe a man, wife, and one other — which are producing more than six or seven

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adults were producing on these same home-farms say 40 or 50 years ago. But the cost of distributing the necessities and amenities of life has meanwhile risen at least as far as costs of production have fallen.

I remember one simple but moving little story which illustrates this point better than anything else I can think of.

It was told to me by Agnes MacPhail, Canada's first woman MP, and as fine and faithful a public servant as this country ever produced.

Agnes had lost her own seat in Ontario and was running as an independent in a huge constituency in northern Saskatchewan. I believe it was the seat which is now represented by our distinguished prime minister.

But back in that first year of the war Agnes was campaigning in that vast, sparsely settled area. She was driving her Ford car, and stopping, not only to prosperous farms, but at all the isolated little cabins and shacks in that frontier country. Agnes was carrying some apples, lying loose on the seat of her car. At one lonely pioneer's home she drove up and a youngster ran out. Agnes immediately made friends. But when she offered the child an apply the child hung back. It turned out on inquiry from the mother that this Canadian youngster had never seen, much less tasted, a single apple in her whole young life. Yet in those days after the depression of the thirties, tons of fruit lay unsold and unmoved in the Okanagan and other primary producing districts of Canada.

They say an apple a day keeps the doctor away. The producers of the Okanagan, Niagara and Annapolis districts of Canada could product an apple a day for every man, woman and child in Canada. They could, in fact, almost do that with one hand tied behind their backs. They would be delighted to do so for a flat, guaranteed annual wage.

But under our present muddled up, cluttered up, price hold-up system nobody has so far been able to figure a way of getting the apple a day to all the people who need and want them.

—Elmore Philpott

Editor's Note: Technocracy can solve this distribution puzzle.

Consumers Become Important

A SPEAKER BEFORE the Canadian Bar Association, Mr. Philip Cutler, has raised the question of fear of automation.

He did not go far enough in analyzing this fear. He said the worker was afraid because he saw his skill and years of work endangered. The small business man feared his ability to compete in equipping himself with costly machinery, and old, established businesses were perplexed by the vastness of the conversion.

It goes beyond these things. The advent of automation, along with great new discoveries of science, is going to break up a pattern of economics based on the presumption of scarcity. These advances can do away with scarcity.

That is to say, they can providing there is rational control of their application, and not selfish control aimed at narrow, group advantage and disregard for problems of everyday people.

Modern mass production has revealed the importance of the consumer. Automation will enhance his importance. There is no sense dropping goods off the end of a production line if there is a limited market to absorb them.

The workers make up by far the greater bulk of consumers. Nothing could be more disastrous to a mass production system than a large-scale interference with or contraction of their buying power.

The hurdle that has to be jumped is the sharing of benefits of automation. Minds conditioned by scarcity concepts, and trained to techniques of exploiting scarcity, have got to be re-conditioned somehow to broader, more rational concepts of the possibilities of science and automation in terms of providing more for larger numbers of people.

Automation won't work on any other basis.

—Vancouver Province

★ BEVERLY HILLS, Calif.—Nobel prize winner Dr. Harold C. Urey, who discovered 'heavy water,' warned that Russia may catch and pass the U.S.A. in the field of science. *—United Press International*

Automation Invades Bank

VANCOUVER—The newest marvel is a $15,000 steel box with rows of buttons and a soft hum inside. When given a job it clicks and flashes green or red lights.

Automation has come to the banking business.

A green light means the operator hasn't offended by feeding wrong information into a slitlike mouth on the machine. A red light says the machine won't budge until an error is corrected. Most likely mistake is trying to post an entry to the wrong account.

It's so automatic, fast and accurate that a pretty girl can juggle millions while she smiles at the customers.

You can see her doing it behind the thick glass that fronts the Bank of Nova Scotia new $2,500,000 building on Hastings at Seymour.

A magnetic electric brain is the secret. All the figures that you see typed on your bank statement are printed by this machine but at the same time it prints a magnetic field on the back of the paper recording all the information.

Debits and credits are entered and a balance struck in the same way as in old fashioned bookkeeping machines.

Each customer has a code number. If the operator gives a code number that doesn't agree with the one magnetically printed in the back of the sheet the red light goes on.

An overall balance for the whole banking operation can be found by simply feeding all the ledger sheets through a slot as fast as you could drop letters in a mail box.

Bankers say three of the machines will do the work of seven of the old type. Besides giving a faster service to the customer the new machine earns its cost by replacing human hands.

The Bank of Nova Scotia main office will operate two of the new magnetic-electronic computers. The girls will have a coffee break in mid-morning and afternoon and an hour for lunch. The room will be filled with soft music. **—Vancouver Province**

TECHNOCRACY

NORTH AMERICA'S ONLY SOCIAL DYNAMIC

WHAT ?

★ Technocracy is the only North American social movement with a North American program which has become widespread on this Continent. It has no affiliation with any other organization, group or association either in North America or elsewhere.

★ The basic unit of Technocracy is the chartered Section consisting of a minimum of 50 members and running up to several hundred.

★ It is not a commercial organization or a political party; it has no financial subsidy or endowment and has no debts. Technocracy is supported entirely by the dues and donations of its own members. The widespread membership activities of Technocracy are performed voluntarily; no royalties, commissions or bonuses are paid, and only a small full-time staff receives subsistence allowances. The annual dues are $9.00 which are paid by the member to his local Section.

★ Members wear the chromium and vermilion insignia of Technocracy — the Monad, an ancient generic symbol signifying balance.

WHERE ?

★ There are units and members of Technocracy in almost every State in the U.S. and in all Provinces in Canada, and in addition there are members in Alaska, Hawaii, Panama, Puerto Rico and in numerous other places with the Armed Forces.

★ Members of Technocracy are glad to travel many miles to discuss Technocracy's Program with any interested people and Continental Headquarters will be pleased to inform any one of the location of the nearest Technocracy unit.

WHEN ?

★ Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers and economists that become known in 1920 as The Technical Alliance — a research organization. In 1933 it was incorporated under the laws of the State of New York as a non-profit, non-political, non-sectarian membership organization. In 1934, Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundations of the present nation-wide membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing.

WHO ?

★ Technocracy was built in North America by North Americans. It is composed of North American citizens in all walks of life. Technocracy's membership is a composite of all the occupations, economic levels, races and religions which make up this Continent. Membership is open only to North American citizens. Aliens and politicians are not eligible. (By politicians is meant those holding elective political office or active office in any political party.)

★ Doctor, lawyer, storekeeper, farmer, mechanic, teacher, preacher or housewife — as long as you are a patriotic North American — you are welcome in Technocracy.

TECHNOCRACY

Whatever the future of Technocracy, one must fairly say that it is the only program of social and economic reconstruction which is in complete intellectual and technical accord with the age in which we live.

—**Encyclopedia Americana**